AirWorks AWK-1121 User's Manual

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AirWorks AWK-1121 User's Manual

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Technical Support Contact Information

www.moxa.com/support

Moxa Americas
Toll-free: 1-888-669-2872
Tel: +1-714-528-6777
Fax: +1-714-528-6778

Moxa China (Shanghai office)
Toll-free: 800-820-5036
Tel: +86-21-5258-9955
Fax: +86-21-5258-5505

Moxa Europe
Tel: +49-89-3 70 03 99-0
Fax: +49-89-3 70 03 99-99

Moxa Asia-Pacific
Tel: +886-2-8919-1230
Fax: +886-2-8919-1231

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1

Introduction

The AirWorks AWK-1121 enables wireless users to access network resources wirelessly. The AWK-1121 is rated to operate at temperatures ranging from 0 to 60°C for standard models and -40 to 75°C for wide temperature models, and is rugged enough for any harsh industrial environment.

The following topics are covered in this chapter:

- **Overview**
- **Package Checklist**
- **Product Features**
- **Product Specifications**
- **Functional Design**
  - LED Indicators
  - Beeper
  - Reset Button

Overview

The AWK-1121 Client is ideal for applications that are hard to wire, too expensive to wire, or use mobile equipment that connects to a TCP/IP network. The AWK-1121 can operate at temperatures ranging from 0 to 60°C for standard models and -40 to 75°C for wide temperature models, and is rugged enough for any harsh industrial environment. Installation is easy, with either DIN-Rail mounting or wall mounting in distribution boxes. The DIN-Rail/wall mounting capability, wide operating temperature range, and IP30 housing with LED indicators make the AWK-1121 a convenient yet reliable solution for any industrial wireless application.

Package Checklist

Moxa's AWK-1121 is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- AWK-1121
- Swivel-type antenna (2dBi, RP-SMA, 2.4&5GHz)
- Quick Installation Guide
- Software CD
- Moxa Product Warranty Card
- Resistive terminator
- Protective caps

NOTE

The above items come with the standard AWK-1121 model, but the package contents may vary for customized versions.

Product Features

- IEEE802.11a/b/g compliant
- Dedicated client
- Advanced wireless security:
  - 64-bit and 128-bit WEP/WPA/WPA2
  - SSID Hiding/IEEE 802.1X/RADIUS
  - Packet access control & filtering
- Turbo Roaming enables rapid handover (client based)
- ABC-01 for configuration import/export
- Dedicated antenna selection
- Free firmware update for more advanced functions
- RS-232 console management
- Wide -40 to 75°C operating temperature range (-T model)
- Redundant 24 VDC power inputs or IEEE802.3af Power over Ethernet (PoE model)
- DIN-Rail or wall mounting
- IP30 protected high-strength metal housing

Product Specifications

WLAN Interface

Standards:

IEEE 802.11a/b/g for Wireless LAN

IEEE 802.11i for Wireless Security

IEEE 802.3u for 10/100BaseT(X)

IEEE 802.3af for Power-over-Ethernet (PoE model)

Spread Spectrum and Modulation (typical):

• DSSS with DBPSK, DQPSK, CCK

• OFDM with BPSK, QPSK, 16QAM, 64QAM

• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps

• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps

Operating Channels (central frequency):

US:

2.412 to 2.462 GHz (11 channels)

5.18 to 5.24 GHz (4 channels)

EU:

2.412 to 2.472 GHz (13 channels)

5.18 to 5.24 GHz (4 channels)

JP:

2.412 to 2.472 GHz (13 channels, OFDM)

2.412 to 2.484 GHz (14 channels, DSSS)

5.18 to 5.24 GHz (4 channels for W52)

Security:

• SSID broadcast enable/disable

• Firewall for MAC/IP/Protocol/Port-based filtering

• 64-bit and 128-bit WEP encryption, WPA /WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)

Transmission Rates:

802.11b: 1, 2, 5.5, 11 Mbps

802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

TX Transmit Power:

802.11b:

Typ. 18±1.5 dBm @ 1 to 11 Mbps

802.11g:

Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 17±1.5 dBm @ 36 Mbps,Typ. 16±1.5 dBm @ 48 Mbps, Typ. 16±1.5 dBm @ 54 Mbps

802.11a:

Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 Mbps, Typ. 15±1.5 dBm @ 48 Mbps, Typ. 14±1.5 dBm @ 54 Mbps

RX Sensitivity:

802.11g:

-88 dBm @ 6 to 24 Mbps, -85 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -70 dBm @ 54 Mbps

802.11a:

-88 dBm @ 6 to 24 Mbps, -85 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -70 dBm @ 54 Mbps

802.11b:

-97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps

Protocol Support

General Protocols: DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP

Interface

Default Antenna: 2 dBi dual-band omni-directional antenna, RP-SMA (male)

Connector for External Antennas: RP-SMA (female)

LAN Ports: 1, 10/100BaseT(X), auto negotiation speed (RJ45-type)

Console: RS-232 (RJ45-type)
LED Indicators: PWR, FAULT, STATE, signal strength, WLAN, LAN
Weight: 400 g
Dimensions: 50 x 115 x 70 mm (2.0 x 4.5 x 2.8 in)
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant, PoE model only)
Connector: 4-pin removable terminal block
Power Consumption:
• 0.16 to 0.55 A @ 12 to 48 VDC
• 0.28 A @ 24 VDC
Reverse Polarity Protection: Present

Regulatory Approvals

Safety: EN60950-1, UL60950-1
Radio: EN300 328, EN 301 893, DSPR (Japan)
EMC: EN301 489-1/-17, FCC Part 15, EN55022/55024, IEC61000-6-2/-4
Transportation: EN50155 (Environmental), EN50121-1/-4 (Environmental), Directive 72/245/EEC (for e/E-mark)
Hazardous Location: UL/cUL Class I, Div. 2; ATEX Class I, Zone 2
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

ATTENTION

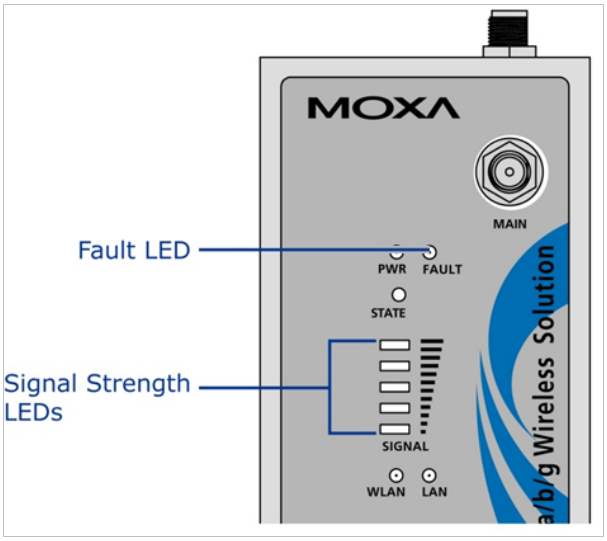
- The AWK-1121 is NOT a portable mobile device and should be located at least 20 cm away from the human body.
- The AWK-1121 is NOT designed for the general public. A well-trained technician should be enlisted to ensure safe deployment of AWK-1121 units, and to establish a wireless network.

Functional Design

LED Indicators

The LEDs on the front panel of the AWK-1121 provide a quick and easy means of determining the current operational status and wireless settings.

The **FAULT** LED indicates system failures and user-configured events. If the AWK-1121 cannot retrieve the IP address from a DHCP server or if there is an IP conflict, the **FAULT** LED will blink at one second intervals. The **SIGNAL** LEDs indicate signal strength.



ATTENTION

The **FAULT**, **SIGNAL**, **STATE** and **WLAN** LEDs lighting up simultaneously and blinking at one second intervals indicates that the system has failed to boot. This may be due to improper operation or an uncontrollable factor, such as an unexpected shutdown during firmware update. Instructions on how to recover the firmware can be found in Appendix B in the "Firmware Recovery" section.

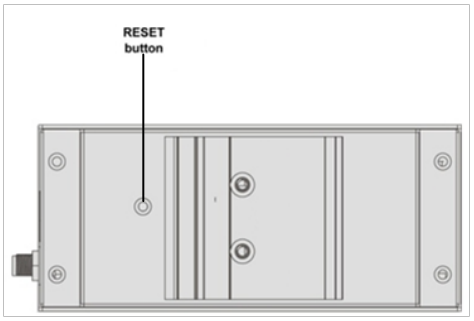
Beeper

The beeper emits two short beeps when the system is ready.

Reset Button

The **RESET** button is located on the back panel of the AWK-1121. You can reboot the AWK-1121 or reset it to factory default settings by pressing the **RESET** button with a pointed object such as an unfolded paper clip.

- **System reboot:** Hold the RESET button down for under 5 seconds and then release.
- **Reset to factory defaults:** Hold the RESET button down for ***more than*** 5 seconds until the **STATE** LED starts blinking green. Release the button to reset the AWK-1121.



2

Getting Started

This chapter explains how to install Moxa's AirWorks AWK-1121 for the first time, and quickly set up your wireless network and test whether the connection is running well. The function guide provides a convenient means of determining which functions you need to use.

The following topics are covered in this chapter:

- **First-time Installation and Configuration**
- **Function Map**

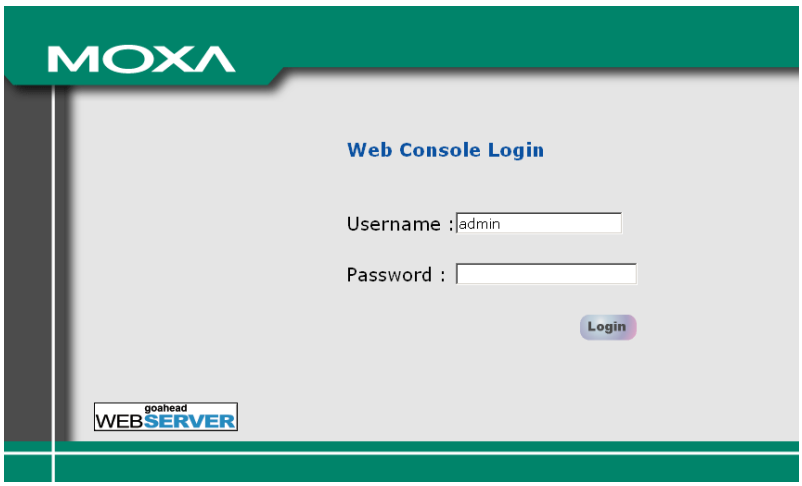
First-time Installation and Configuration

Before installing the AWK-1121, make sure that all items in the Package Checklist are in the box. You will need access to a notebook computer or PC equipped with an Ethernet port. The AWK-1121 has a default IP address that must be used when connecting to the device for the first time.

- **Step 1: Select the power source.**
  The AWK-1121 may be powered by a DC power input or PoE (Power over Ethernet, PoE model only).
- **Step 2: Connect the AWK-1121 to a notebook or PC.**
  Since the AWK-1121 supports MDI/MDI-X auto-sensing, either a straight-through or crossover cable may be used to connect to a computer. The LAN port LED indicator will light up when a connection is established.
- **Step 3: Set up the computer's IP address.**
  Choose an IP address on the same subnet as the AWK-1121. Since the AWK-1121's default IP address is **192.168.127.253**, and the subnet mask is **255.255.255.0**, you should set the IP address of the computer to **192.168.127.xxx**.

NOTE After you select **Maintenance** → **Load Factory Defaults** and click the **Activate** button, the AWK-1121 will be reset to factory default settings and the IP address will be reset to **192.168.127.253**.

- **Step 4: Use the web-based manager to configure the AWK-1121**
  Open your computer's web browser and type **http://192.168.127.253** in the address field to access the homepage of the web-based Network Manager. Before the homepage opens, you will need to enter the user name and password as shown in the following figure. For first-time configuration, enter the default user name and password and then click on the **Login** button:

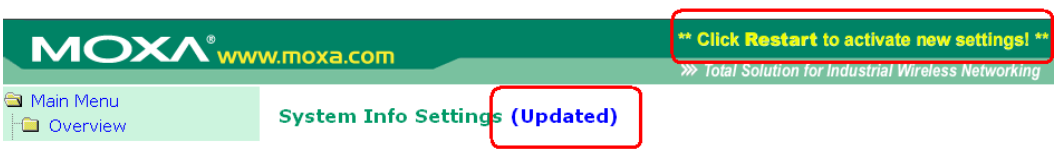


NOTE Default user name and password:

User Name: **admin**
Password: **root**

For security reasons, we strongly recommend changing the default password. To do so, select **Maintenance** → **Password**, and then follow the on-screen instructions to change the password.

NOTE After you click **Submit** to apply changes the web page will refresh **(Updated)** will appear on the page and a blinking reminder will be shown on the upper-right corner of the web page:



To activate the changes click **Restart** and then **Save and Restart** after you change the settings. About 30 seconds are needed for the AWK-1121 to complete the reboot procedure.

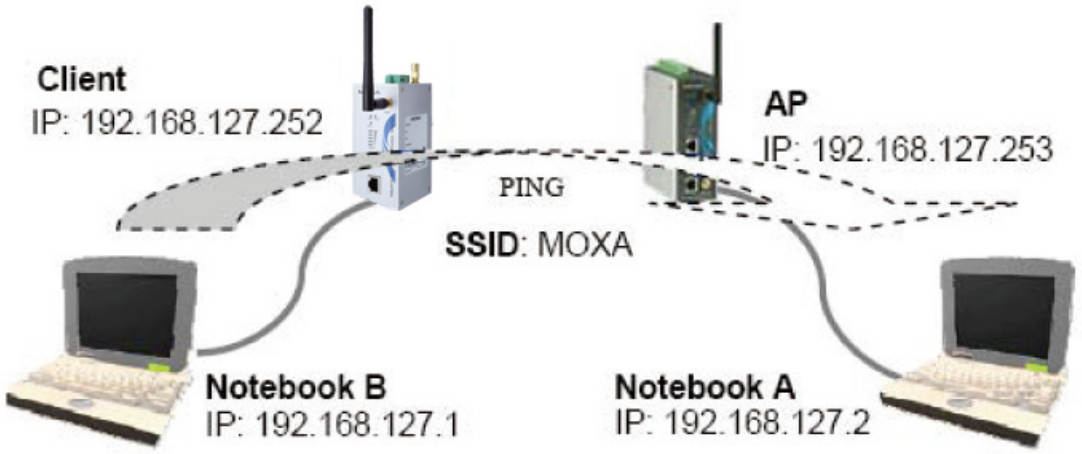
- **Step 5: Test communications.**
  The following section describes one test method that can be used to verify a network connection has been established.

Communication Testing

After installing the AWK-1121 a simple test may be run against an AP to make sure the AWK-1121 has properly established a wireless connection and is functioning normally. In the example below, an AWK-3121 is used as the primary access point.

How to Test an AWK-1121 for Network Connectivity

Connect an AP-configured AWK-3121 (or another access point) to Notebook A. Connect an AWK-1121 to Notebook B. Configure the AWK-1121 and AWK-3121 for the same SSID, and set their IP addresses as below.

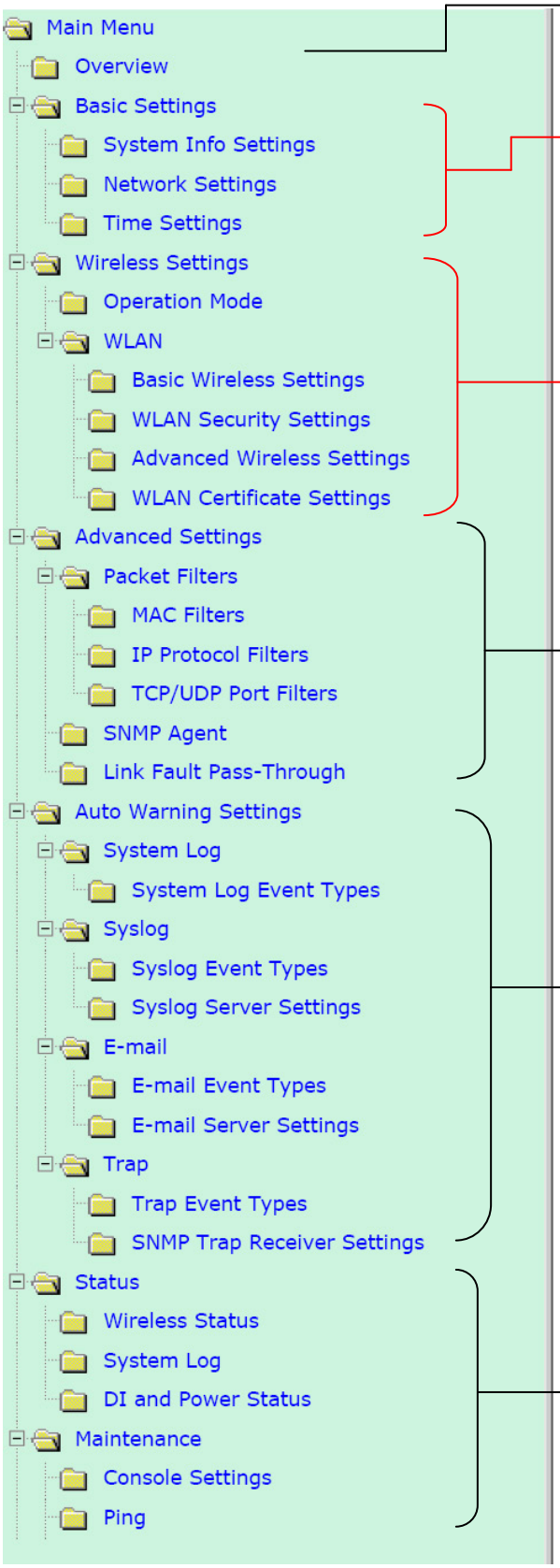


After setting up the testing environment, open a DOS window on notebook B. At the prompt, type:

ping *<IP address of notebook A>*

and then press **Enter**. A "Reply from IP address …" response means the communication was successful. A "Request timed out" response means the communication failed. In this case, be sure to first recheck the configuration to make sure the connections are correct.

Function Map



Quick overview of the AWK-1121's information

Basic settings for administering the AWK-1121

Essential settings related to establishing a wireless network

Advanced features to support additional network management and secure wired and wireless communication

Note: These advanced functions are all optional.

Application-oriented device management functions to set up events, traps, and reactions via e-mail and SNMP notification

Note: These functions are all optional.

Real-time status information for monitoring and maintaining network performance, advanced services, and device management functions.

3

Web Console Configuration

In this chapter, we explain all aspects of web-based console configuration. Moxa's easy-to-use management functions help you set up your AWK-1121 and make it easy to establish and maintain your wireless network.

The following topics are covered in this chapter:

- **Web Browser Configuration**
- **Overview**
- **Basic Settings**
  - System Info Settings
  - Network Settings
  - Time Settings
- **Wireless Settings**
  - Operation Mode
  - WLAN
- **Advanced Settings**
  - Packet Filters
  - SNMP Agent
  - Link Fault Pass-Through
- **Auto Warning Settings**
  - System Log
  - Syslog
  - E-mail
  - Trap
- **Status**
  - Wireless Status
  - System Log
  - Power Status
- **Maintenance**
  - Console Settings
  - Ping
  - Firmware Upgrade
  - Config Import/Export
  - Load Factory Defaults
  - Password
  - Misc. Settings
- **Save Configuration**
- **Restart**
- **Logout**

Web Browser Configuration

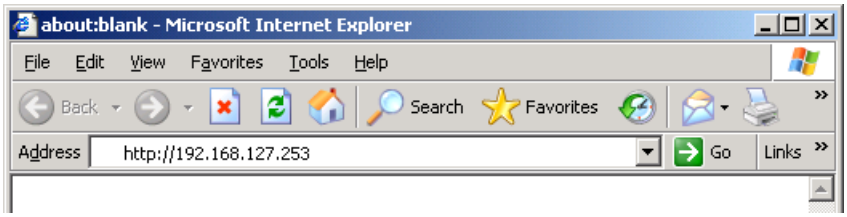
Moxa AWK-1121's web browser interface provides a convenient way to modify its configuration and access the built-in monitoring and network administration functions. The recommended web browser is Microsoft® Internet Explorer with JVM (Java Virtual Machine) installed.

NOTE To use the AWK-1121's management and monitoring functions from a PC host connected to the same LAN as the AWK-1121, you must make sure that the PC host and the AWK-1121 are on the same logical subnet. Similarly, if the AWK-1121 is configured for other VLAN settings, you must make sure your PC host is on the management VLAN.

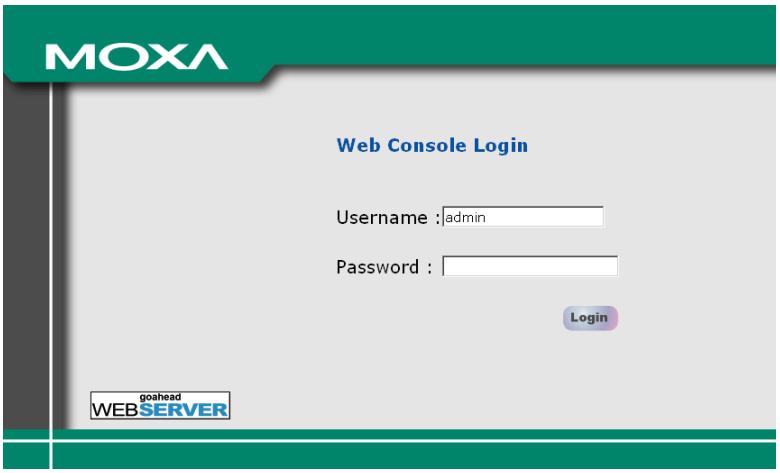
The Moxa AWK-1121's default IP is **192.168.127.253**.

Follow these steps to access the AWK-1121's web-based console management interface.

1. Open your web browser (e.g., Internet Explorer) and type the AWK-1121's IP address in the address field. Press **Enter** to establish the connection.



2. The Web Console Login page will open. Enter the password (default Username = **admin**; default Password = **root**) and then click **Login** to continue.



3. You may need to wait a few moments for the web page to download to your computer. Note that the Model name and IP address of your AWK-1121 are both shown in the title bar of the web page. This information can be used to help you identify multiple AWK-1121 units.

4. Use the menu tree on the left side of the window to open the function pages to access each of the AWK-1121's functions.

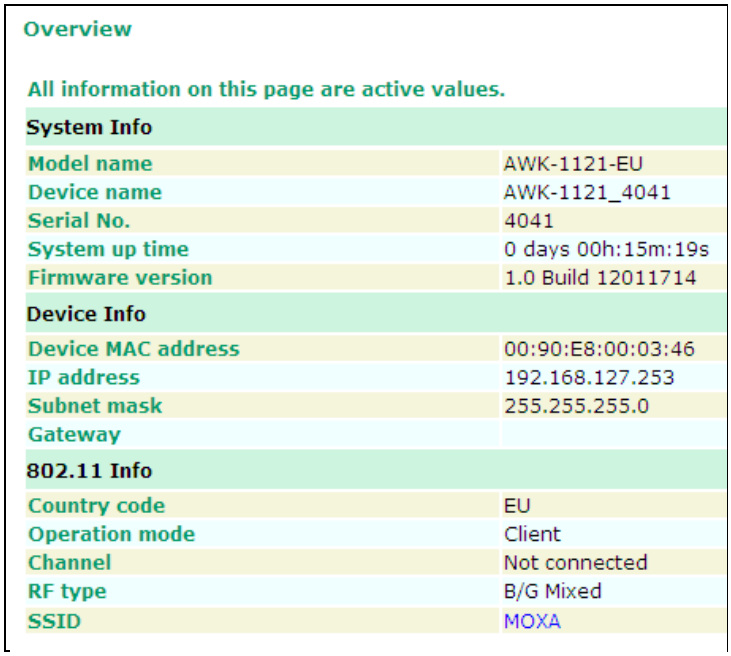
In the following paragraphs, we describe each AWK-1121 management function in detail. A quick overview is available in this manual in the "Function Map" section of Chapter 2.

NOTE The model name of the AWK-1121 is shown as AWK-1121-XX, where XX indicates the country code. The country code indicates the AWK-1121 version and which bandwidth it uses. We use **AWK-1121-US** as an example in the following figures. (The country code and model name that appears on your computer screen may be different than the one shown here.)

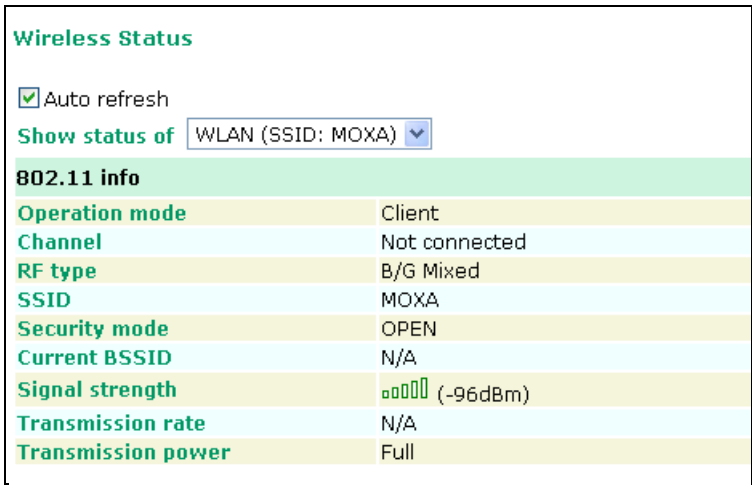
NOTE For security reasons, you will need to log back into the AWK-1121 after a 5-minute time-out.

Overview

The **Overview** page summarizes the AWK-1121's current status. The information is categorized into several groups: **System Info**, **Device Info**, and **802.11 Info**.



Click on **SSID** for more detailed 802.11 information, as shown in the following figure.

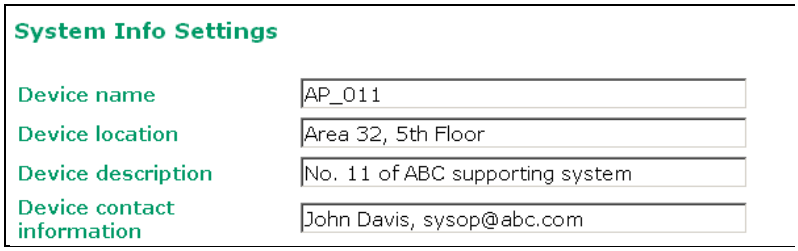


Basic Settings

The Basic Settings group includes the most commonly used settings required by administrators to maintain and control the AWK-1121.

System Info Settings

System Info labels (especially ***Device name***) are displayed and included on the **Overview** page, in SNMP information, and in alarm emails. Giving descriptive, unique labels to items under **System Info** makes it easier to identify the different AWK-1121 units connected to your network.


System Info Settings
Device name AP_011
Device location Area 32, 5th Floor
Device description No. 11 of ABC supporting system
Device contact information John Davis, sysop@abc.com

Device name

Setting	Description	Factory Default
Max. 31 of characters	This option is useful for specifying the role or application of different AWK-1121 units.	AWK-1121_<Serial No. of this AWK-1121>

Device location

Setting	Description	Factory Default
Max. of 31 characters	Specifies the location of different AWK-1121 units.	None

Device description

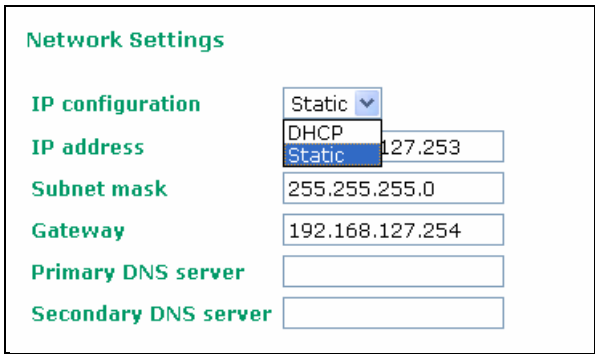
Setting	Description	Factory Default
Max. of 31 characters	Use this space to record a more detailed description of the AWK-1121	None

Device contact information

Setting	Description	Factory Default
Max. of 31 characters	Provides information about whom to contact in order to resolve problems. Use this space to record contact information of the person responsible for maintaining this AWK-1121.	None

Network Settings

The Network Settings configuration panel allows you to modify the usual TCP/IP network parameters. An explanation of each configuration item is given below.



IP configuration

Setting	Description	Factory Default
DHCP	The AWK-1121's IP address will be assigned automatically by the network's DHCP server	Static
Static	Set up the AWK-1121's IP address manually.	

IP address

Setting	Description	Factory Default
AWK-1121's IP address	Identifies the AWK-1121 on a TCP/IP network.	192.168.127.253

Subnet mask

Setting	Description	Factory Default
AWK-1121's subnet mask	Identifies the type of network to which the AWK-1121 is connected (e.g., 255.255.0.0 for a Class B network, or 255.255.255.0 for a Class C network).	255.255.255.0

Gateway

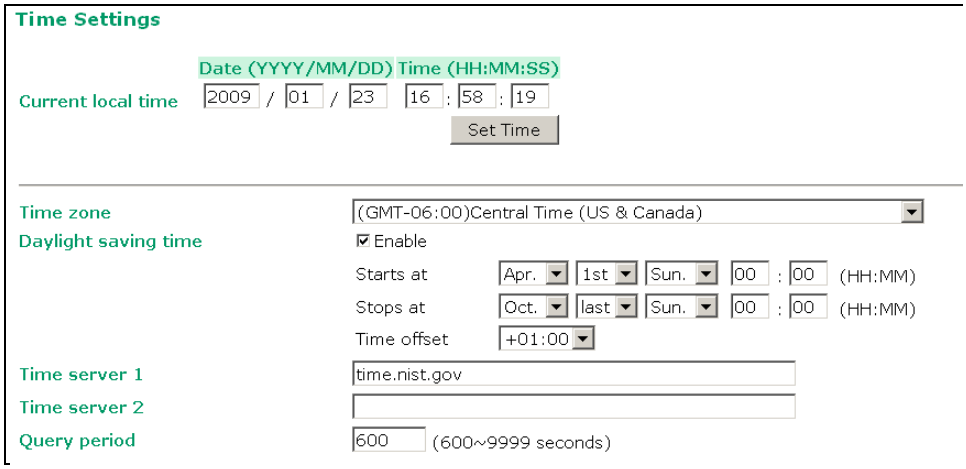
Setting	Description	Factory Default
AWK-1121's default gateway	The IP address of the router that connects the LAN to an outside network.	None

Primary/ Secondary DNS server

Setting	Description	Factory Default
IP address of the Primary/Secondary DNS server	The IP address of the DNS Server used by your network. After entering the DNS Server's IP address, you can input the AWK-1121's URL (e.g., http://ap11.abc.com) in your browser's address field instead of entering the IP address. The Secondary DNS server will be used if the Primary DNS server fails to connect.	None

Time Settings

The AWK-1121 has a time calibration function based on information from an NTP server or user specified Date and Time information. Functions such as Auto warning can add real-time information to the message.



The ***Current local time*** shows the AWK-1121's system time when you open this web page. You can click on the **Set Time** button to activate the updated date and time parameters. An "(Updated)" string will appear to indicate that the change is complete. Local time settings will be immediately activated in the system without running Save and Restart.

NOTE The AWK-1121 has a built-in real time clock (RTC). We strongly recommend that users update the **Local time** for the AWK-1121 after the initial setup or a long-term shutdown, especially when the network does not have an Internet connection for accessing the NTP server or there is no NTP server on the LAN.

Current local time

Setting	Description	Factory Default
User adjustable time	The date and time parameters allow configuration of the local time, with immediate activation. *Use 24-hour format: yyyy/mm/dd hh:mm:ss*	None

Time zone

Setting	Description	Factory Default
User selectable time zone	The time zone setting allows conversion from GMT (Greenwich Mean Time) to local time.	GMT (Greenwich Mean Time)

ATTENTION

Changing the time zone will automatically adjust the **Current local time**. You should configure the **Time zone** before setting the **Current local time**.

Daylight saving time

Setting	Description	Factory Default
Enable/ Disable	Daylight saving time (also know as DST or summer time) involves advancing clocks (usually 1 hour) during the summer time to provide an extra hour of daylight in the afternoon.	Disabled

When **Daylight saving time** is enabled, the following parameters will be shown:

- **Starts at:** The date that daylight saving time begins.
- **Stops at:** The date that daylight saving time ends.
- **Time offset:** Indicates how many hours forward the clock should be advanced.

Time server 1/2

Setting	Description	Factory Default
IP/Name of Time Server 1/2	IP or Domain name of the NTP time server. The 2nd NTP server will be used if the 1st NTP server fails to connect.	time.nist.gov

Query period

Setting	Description	Factory Default
Query period time (1 to 9999 seconds)	This parameter determines how often the time is updated from the NTP server.	600 (seconds)

Wireless Settings

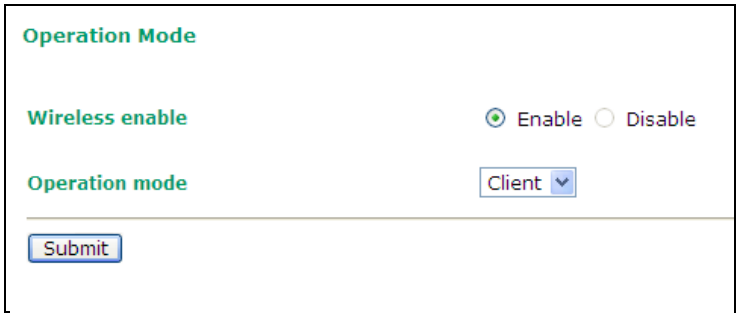
The essential settings for wireless networks are presented in this function group. Settings must be properly set before establishing your wireless network. Familiarize yourself with the following terms before starting the configuration process:

The AWK-1121 as a client can be used as an Ethernet-to-wireless (or LAN-to-WLAN) network adapter. For example, a notebook computer equipped with an Ethernet adaptor but no wireless card can be connected to this device with an Ethernet cable to provide wireless connectivity to another AP.

NOTE Although it is more convenient to use dynamic bridging, there is a limitation—the AP Client can only transmit IP-based packets between its wireless interface (WLAN) and Ethernet interface (LAN); other types of traffic (such as IPX and AppleTalk) are not forwarded.

Operation Mode

The AWK-1121 is a dedicated WLAN client, so its only operation mode is client. Other client-based operation modes may be added in the future firmware releases.



Wireless Enable

Setting	Description	Factory Default
Enable/Disable	The RF (Radio Frequency) module can be manually turned on or off.	Enabled

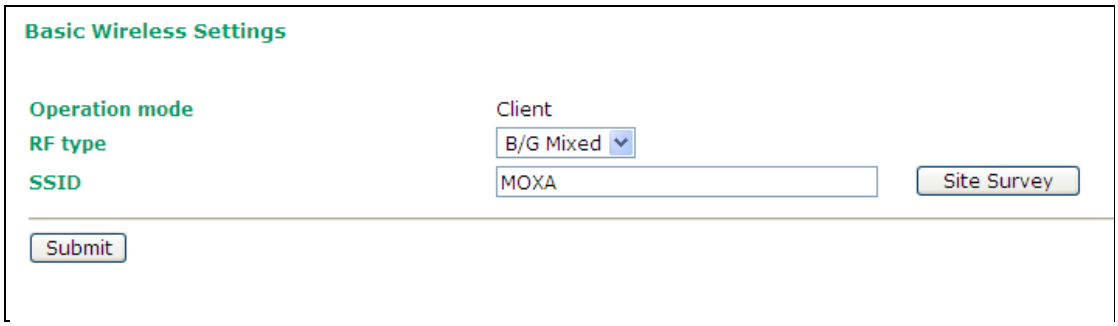
Operation Mode

Setting	Description	Factory Default
Client	The AWK-1121 only operates as a wireless client.	Client

WLAN

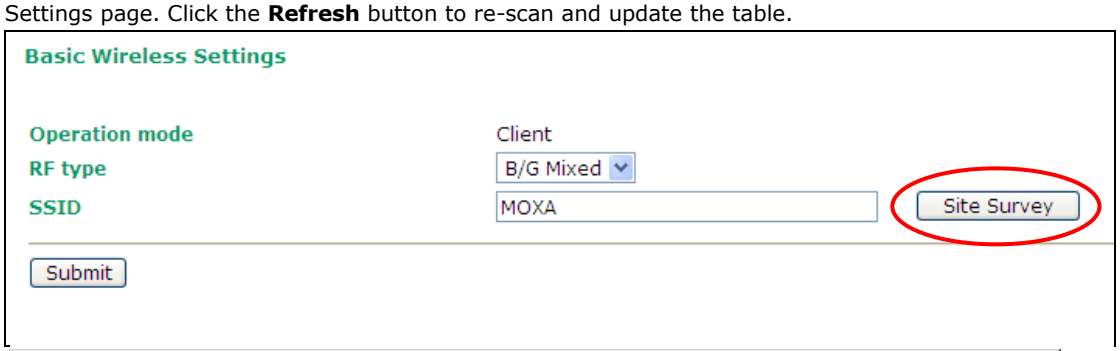
Basic Wireless Settings

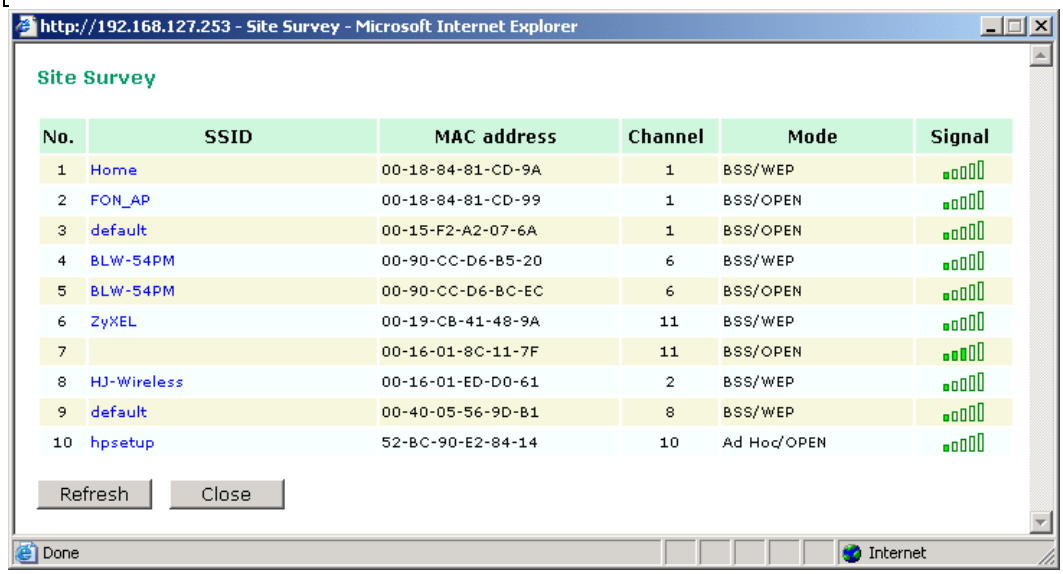
The "WLAN Basic Setting Selection" panel is used to edit SSIDs and set the RF type. The RF type selection will configure the AWK-1121 to either the 2.4GHz or 5GHz frequency band. An SSID is a unique identifier that wireless networking devices use to establish and maintain wireless connectivity. Set the SSID parameter to match that of the APs you wish to connect to, so that the AWK-1121 will associate with network defined by the SSID.



NOTE

Click the "Site Survey" button to view information about available APs, as shown in the following figure. You can click on the SSID of an entity and bring the value of its SSID onto the SSID field of the Basic Wireless Settings page. Click the **Refresh** button to re-scan and update the table.




http://192.168.127.253 - Site Survey - Microsoft Internet Explorer
Site Survey
No. SSID MAC address Channel Mode Signal
1 Home 00-18-84-81-CD-9A 1 BSS/WEP
2 FON_AP 00-18-84-81-CD-99 1 BSS/OPEN
3 default 00-15-F2-A2-07-6A 1 BSS/OPEN
4 BLW-54PM 00-90-CC-D6-B5-20 6 BSS/WEP
5 BLW-54PM 00-90-CC-D6-BC-EC 6 BSS/OPEN
6 ZyXEL 00-19-CB-41-48-9A 11 BSS/WEP
7 00-16-01-8C-11-7F 11 BSS/OPEN
8 HJ-Wireless 00-16-01-ED-D0-61 2 BSS/WEP
9 default 00-40-05-56-9D-B1 8 BSS/WEP
10 hpsetup 52-BC-90-E2-84-14 10 Ad Hoc/OPEN
Refresh
Close
Done
Internet

RF type

Setting	Description	Factory Default
A	Supports IEEE802.11a standard only	B/G Mixed
B	Supports IEEE802.11b standard only	
G	Supports IEEE802.11g standard only	
B/G Mixed	Supports both of IEEE802.11b/g standards, but 802.11g can be slowed down when 802.11b clients are on the network	

SSID

Setting	Description	Factory Default
Max. of 31 characters	The SSID must be identical to the target AP for the client and AP to be able to communicate with each other.	MOXA

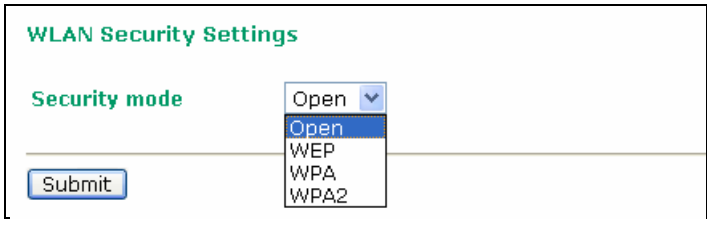
NOTE

The AWK-1121-JP (for Japanese frequency bands) connects only APs with broadcast (i.e: not hidden) SSIDs, in all IEEE802.11a channels and IEEE802.11g channels 1 to 11. The AWK-1121-EU (for European frequency bands) only connects APs with hidden SSIDs in all IEEE802.11b/g channels.

WLAN Security Settings

The AWK-1121 provides four standardized wireless security modes: **Open**, **WEP** (Wired Equivalent Privacy), **WPA** (Wi-Fi Protected Access), and **WPA2**. Several security modes are available in the AWK-1121 by selecting ***Security mode*** and ***WPA type***:

- **Open:** No authentication, no data encryption.
- **WEP:** Static WEP (Wired Equivalent Privacy) keys must be configured manually.
- **WPA/WPA2-Personal:** Also known as WPA/WPA2-PSK. You will need to specify the Pre-Shared Key in the ***Passphrase*** field, which will be used by the TKIP or AES engine as a master key to generate keys that actually encrypt outgoing packets and decrypt incoming packets.
- **WPA/WPA2-Enterprise:** Also called WPA/WPA2-EAP (Extensible Authentication Protocol). In addition to device-based authentication, WPA/WPA2-Enterprise enables user-based authentication via IEEE802.1X. The AWK-1121 can support three EAP methods: EAP-TLS, EAP-TTLS, and EAP-PEAP.



Security mode

Setting	Description	Factory Default
Open	No authentication	Open
WEP	Static WEP is used	
WPA*	WPA is used	
WPA2*	Fully supports IEEE802.11i with "TKIP/AES + 802.1X"	

Open

For security reasons, you should **NOT** set security mode to Open (or "Open System"), since authentication and data encryption are **NOT** performed in Open (or "Open System") mode.

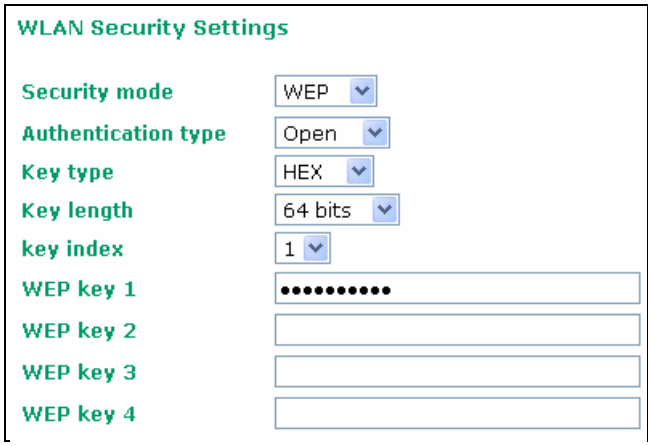
WEP

According to the IEEE802.11 standard, WEP can be used for authentication and data encryption to maintain confidentiality. **Shared** (or **Shared Key**) authentication type is used if WEP authentication and data encryption

are both needed. Normally, **Open** (or **Open System**) authentication type is used when WEP data encryption is run with authentication.

When WEP is enabled as a security mode, the length of a key (so-called WEP seed) can be specified as 64/128 bits, which is actually a 40/104-bit secret key with a 24-bit initialization vector. The AWK-1121 provides 4 entities of WEP key settings that can be selected to use with ***Key index***. The selected key setting specifies the key to be used as a *send-key* for encrypting traffic from the AP side to the wireless client side. All 4 WEP keys are used as *receive-keys* to decrypt traffic from the wireless client side to the AP side.

The WEP key can be presented in two ***Key types***, HEX and ASCII. Each ASCII character has 8 bits, so a 40-bit (or 64-bit) WEP key contains 5 characters, and a 104-bit (or 128-bit) key has 13 characters. In hex, each character uses 4 bits, so a 40-bit key has 10 hex characters, and a 128-bit key has 26 characters.



Authentication type

Setting	Description	Factory Default
Open	Data encryption is enabled, but without authentication	Open
Shared	Data encryption and authentication are both enabled.	

Key type

Setting	Description	Factory Default
HEX	Specifies WEP keys in hex-decimal number form	HEX
ASCII	Specifies WEP keys in ASCII form	

Key length

Setting	Description	Factory Default
64 bits	Uses 40-bit secret keys with 24-bit initialization vector	64 bits
128 bits	Uses 104-bit secret key with 24-bit initialization vector	

Key index

Setting	Description	Factory Default
1-4	Specifies which WEP key is used	None

WEP key 1-4

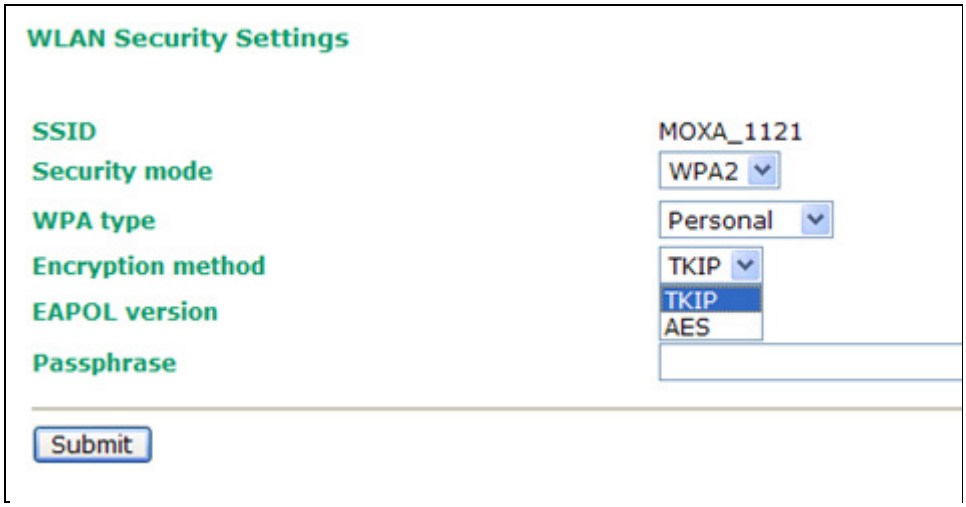
Setting	Description	Factory Default
ASCII type: 64 bits: 5 chars 128 bits: 13chars HEX type: 64 bits: 10 hex chars 128 bits: 26 hex chars	A string that can be used as a WEP seed for the RC4 encryption engine.	None

WPA/WPA2-Personal

WPA (Wi-Fi Protected Access) and WPA2 represent significant improvements over the WEP encryption method. WPA is a security standard based on 802.11i draft 3, while WPA2 is based on the fully ratified version of 802.11i. The initial vector is transmitted, encrypted, and enhanced with its 48 bits, twice as long as WEP. The key is regularly changed so that true session is secured.

Even though AES encryption is only included in the WPA2 standard, it is widely available in the WPA security mode of some wireless APs and clients as well. The AWK-1121 also supports AES algorithms in WPA and WPA2 for better compatibility.

Personal versions of WPA/WPA2, also know as WPA/WPA-PSK (*Pre-Shared Key*), provide a simple way of encrypting a wireless connection for high confidentiality. A ***Passphrase*** is used as a basis for encryption methods (or cipher types) in a WLAN connection. The passphrases should be complicated and as long as possible. There must be at least 8of ASCII characters in the Passphrase, and it could go up to 63. For security reasons, this passphrase should only be disclosed to users who need it, and it should be changed regularly.



WPA type

Setting	Description	Factory Default
Personal	Provides Pre-Shared Key-enabled WPA and WPA2	Personal
Enterprise	Provides enterprise-level security for WPA and WPA2	

Encryption method

Setting	Description	Factory Default
TKIP	Temporal Key Integrity Protocol is enabled	TKIP
AES	Advance Encryption System is enabled	

EAPOL Version

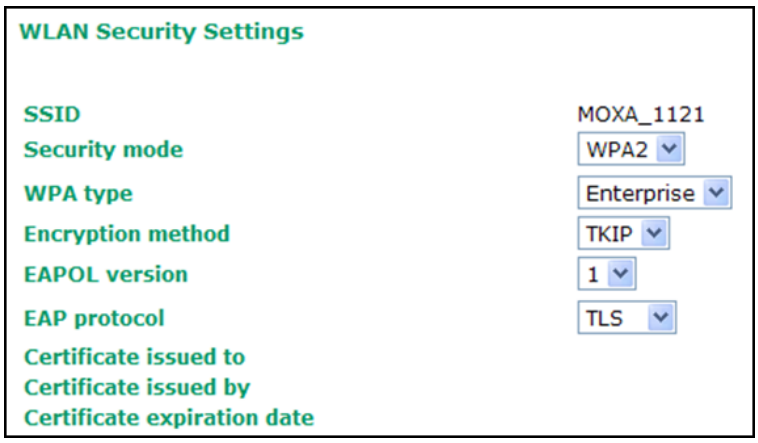
Setting	Description	Factory Default
1	EAPOL version 1 was standardized in the 2001 version of 802.1X, which is much more commonly implemented.	1
2	EAPOL version 2 was specified in 802.1X-2004.	

Passphrase

Setting	Description	Factory Default
8 to 63 characters	Master key to generate keys for encryption and decryption	None

WPA/WPA2-Enterprise

When used as a client, the AWK-1121 can support three EAP methods (or ***EAP protocols***): **EAP-TLS**, **EAP-TTLS**, and **EAP-PEAP**, corresponding to WPA/WPA2-Enterprise settings on the AP side.



EAP Protocol

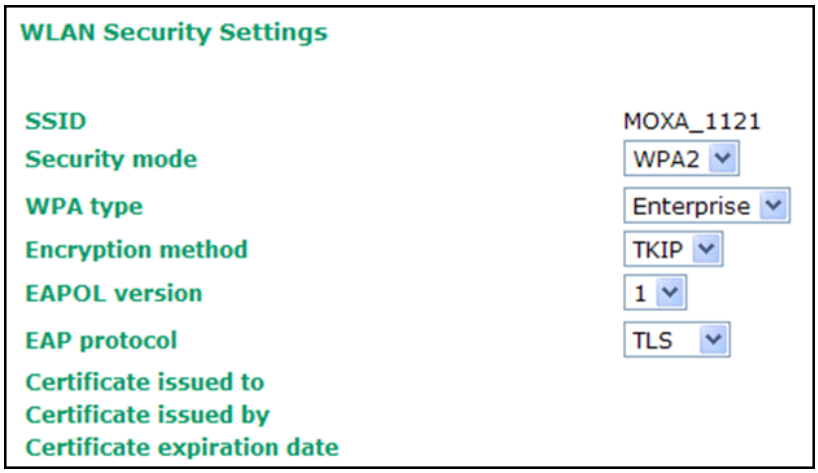
Setting	Description	Factory Default
TLS	Specifies Transport Layer Security protocol	TLS
TTLS	Specifies Tunneled Transport Layer Security	
PEAP	Specifies Protected Extensible Authentication Protocol, or Protected EAP	

Before choosing the EAP protocol for your WPA/WPA2-Enterpise settings on the client end, please contact the network administrator to make sure the system supports the protocol on the AP end. Detailed information on these three popular EAP protocols is presented in the following sections.

EAP-TLS

TLS is the standards-based successor to Secure Socket Layer (SSL). It can establish a trusted communication channel over a distrusted network. TLS provides mutual authentication through certificate exchange. EAP-TLS is also secure to use. You are required to submit a digital certificate to the authentication server for validation, but the authentication server must also supply a certificate.

You can use **Basic Wireless Settings** → **WLAN Certificate Settings** to import your WLAN certificate and enable EAP-TLS on the client end.



- **Certificate issued to:** Shows the certificate user
- **Certificate issued by**: Shows the certificate issuer
- **Certificate expiration date**: Indicates when the certificate has expired

EAP-TTLS

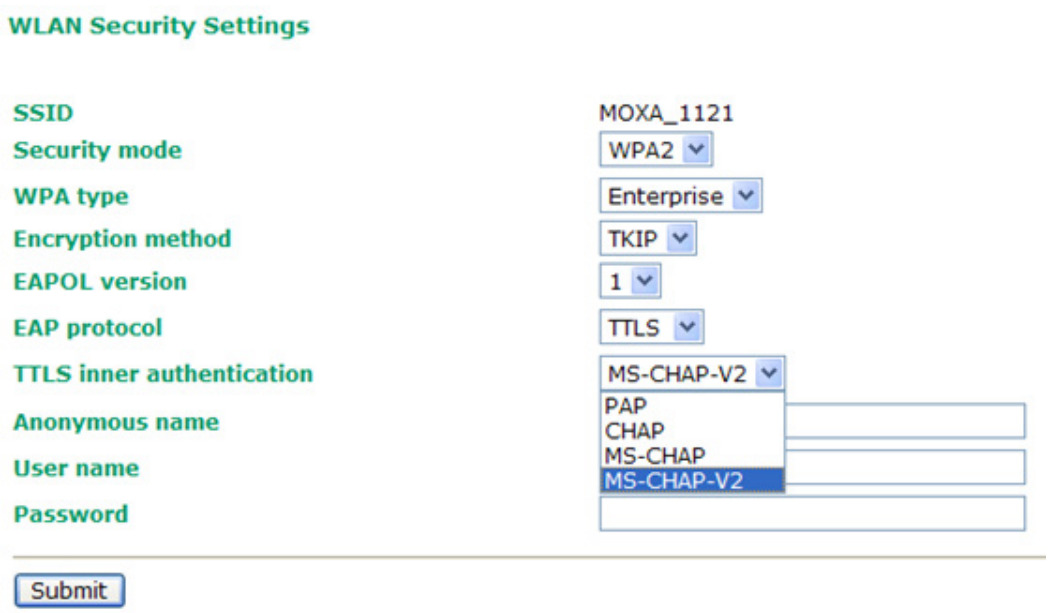
It is usually much easier to re-use existing authentication systems, such as a Windows domain or Active Directory, LDAP directory, or Kerberos realm, rather than creating a parallel authentication system. As a result, TTLS (Tunneled TLS) and PEAP (Protected EAP) are used to support the use of so-called "legacy authentication methods."

TTLS and PEAP work in a similar way. First, they establish a TLS tunnel (EAP-TLS for example), and validate whether the network is trustworthy with digital certificates on the authentication server. This step establishes a tunnel that protects the next step (or "inner" authentication), and consequently is sometimes referred to as "outer" authentication. The TLS tunnel is then used to encrypt an older authentication protocol that authenticates the user for the network.

As you can see, digital certificates are still needed for outer authentication in a simplified form. Only a small number of certificates are required, which can be generated by a small certificate authority. Certificate reduction makes TTLS and PEAP much more popular than EAP-TLS.

The AWK-1121 provides some non-cryptographic EAP methods, including **PAP**, **CHAP**, **MS-CHAP**, and **MS-CHAP-V2**. These EAP methods are not recommended for direct use on wireless networks. However, they may be useful as inner authentication methods with TTLS and PEAP.

Because the inner and outer authentications can use distinct user names in TTLS and PEAP, you can use an anonymous user name for the outer authentication, with the true user name only shown through the encrypted channel. Keep in mind that not all client software supports anonymous alteration. Confirm this with the network administrator before you enable identity hiding in TTLS and PEAP.



TTL Inner Authentication

Setting	Description	Factory Default
PAP	Password Authentication Protocol is used	MS-CHAP-V2
CHAP	Challenge Handshake Authentication Protocol is used	
MS-CHAP	Microsoft CHAP is used	
MS-CHAP-V2	Microsoft CHAP version 2 is used	

Anonymous

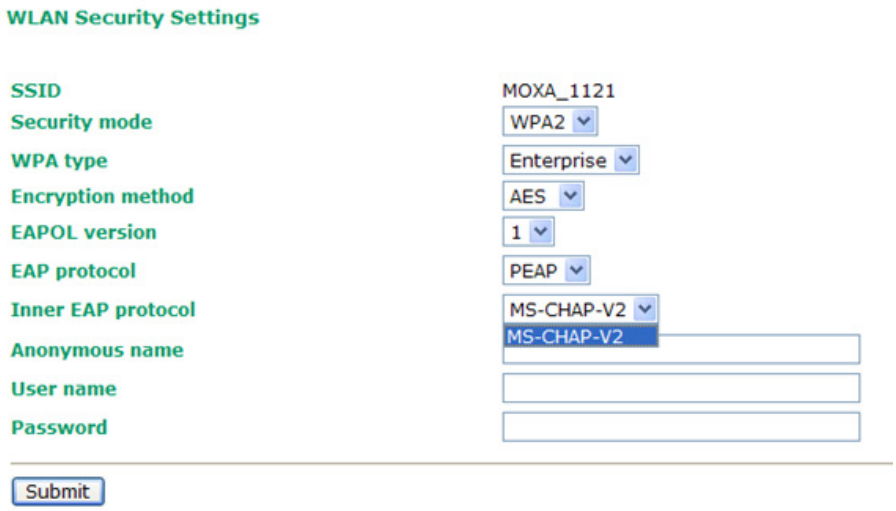
Setting	Description	Factory Default
Max. of 31 characters	A distinct name used for outer authentication	None

User name & Password

Setting	Description	Factory Default
	User name and password used in inner authentication	None

PEAP

There are a few differences in the TTLS and PEAP inner authentication procedures. TTLS uses the encrypted channel to exchange attribute-value pairs (AVPs), while PEAP uses the encrypted channel to start a second EAP exchange inside of the tunnel. The AWK-1121 provides **MS-CHAP-V2** merely as an EAP method for inner authentication.



Inner EAP protocol

Setting	Description	Factory Default
MS-CHAP-V2	Microsoft CHAP version 2 is used	MS-CHAP-V2

Anonymous

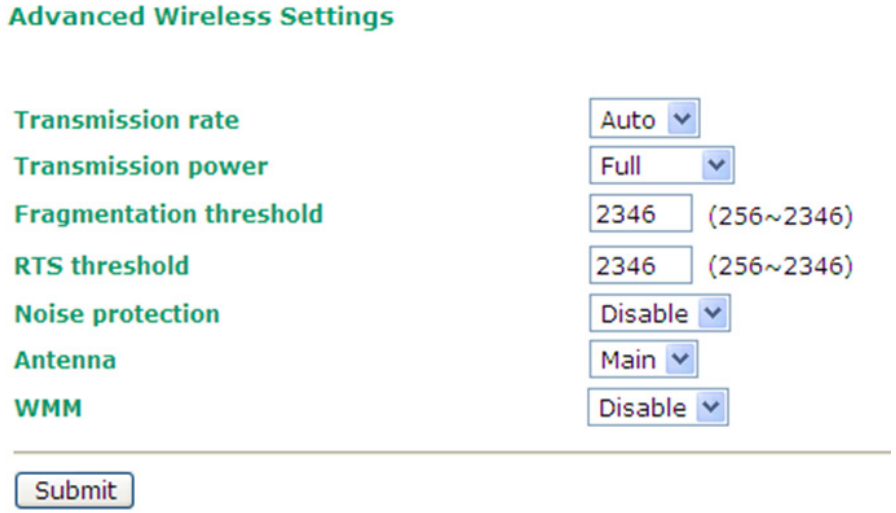
Setting	Description	Factory Default
Max. of 31 characters	A distinct name used for outer authentication	None

User name & Password

Setting	Description	Factory Default
	User name and password used in inner authentication	None

Advanced Wireless Settings

Additional wireless-related parameters are presented in this section to help you set up your wireless network in detail.



Transmission Rate

Setting	Description	Factory Default
Auto	The AWK-1121 senses and adjusts the data rate automatically	Auto
Available rates	Users can manually select a target transmission data rate	

Transmission Power

RF type = B/G mixed (Channel 1~14)

Setting	Description	Factory Default
Auto	Specifies wireless signal coverage by automatically selecting the strength of Tx power	Full
Full	Equivalent to full Tx power	
High	-5 dB of maximum full Tx power	
Medium	-10 dB of maximum full Tx power	
Low	-15 dB of maximum full Tx power	

NOTE **Tx power at "Full"**

- US model: 17 dB
- EU model: 16 dB
- JP model: 18 dB

RF type = A (Channel 36 ~ 48)

Setting	Description	Factory Default
Auto	Specifies wireless signal coverage by automatically selecting the strength of Tx power	Full
Full	Equivalent to full Tx power	
High	-4 dB of full Tx power	
Medium	-8 dB of full Tx power	
Low	-12 dB of full Tx power	

NOTE **Tx power at "Full"**

- US model: 14 dB
- EU model: 16 dB
- JP model: 14 dB

Fragmentation threshold

Setting	Description	Factory Default
Fragment Length (256 to 2346)	Specifies the maximum size a data packet before splitting and creating another new packet	2346

RTS threshold

Setting	Description	Factory Default
RTS/CTS Threshold (256 to 2346)	Determines how large a packet can be before the Access Point coordinates transmission and reception to ensure efficient communication	2346

NOTE You can refer to the related glossaries in Appendix A for detailed information about the above-mentioned settings. By setting these parameters properly, you can better tune the performance of your wireless network.

Noise protection

Setting	Description	Factory Default
Enable/Disable	Adjusts the interference coping capability of the wireless signal. This option should be enabled for communication distance under 500 meters, and should be disabled for communication distances over 500 meters.	Disabled

Antenna

Setting	Description	Factory Default
MAIN	The MAIN antenna is used for wireless communication.	Main
AUX	The AUX antenna is used for wireless communication.	

Note: For installation flexibility, either the MAIN antenna (on the front panel) or the AUX antenna (on the top panel) may be selected for use. Make sure the antenna connection matches the antenna configured in the AWK-1121 interface.

To protect the connectors and RF module, all radio ports should be terminated by either an antenna or a terminator. The use of the resistive terminator for terminating the unused antenna port is strongly recommended.

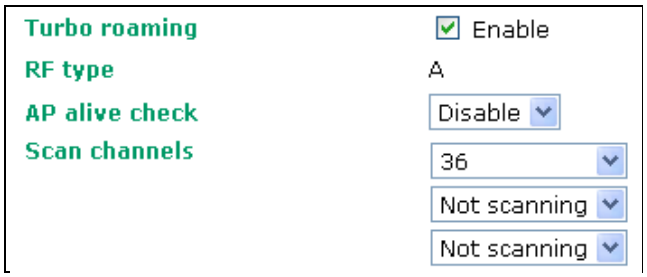
WMM

Setting	Description	Factory Default
Enable/Disable	WMM is a QoS standard for WLAN traffic. Voice and video data will be given priority bandwidth when enabled with WMM supported wireless clients.	Disabled

Turbo Roaming (to be supported in firmware version 1.2)

Setting	Description	Factory Default
Enable/ Disable	Moxa's Turbo Roaming can enable rapid handover when the AWK-1121, as a client, roams among a group of APs.	Disabled

When Turbo Roaming is enabled, the RF type, AP alive check, and Scan channels will be shown as follows. RF type shows the current **RF type** that this client is using. **AP alive check** will check if the AP connection is still available. When this function is enabled, a check will be done every 10 ms. You can set up **Scan channels** for the APs among which this client is going to roam. There are three Scan channels available. Note that the **Scan channels** may need to be modified when the **RF type** is changed. (For example, channel 36 is not available in **B**, **G**, or **B/G Mix** mode.)



WLAN Certification Settings

When EAP-TLS is used, a WLAN Certificate will be required at the client end to support WPA/WPA2-Enterprise. The AWK-1121 can support the **PKCS #12**, also known as *Personal Information Exchange Syntax Standard*, certificate formats that define file formats commonly used to store private keys with accompanying public key certificates, protected with a password-based symmetric key.

Current Status displays information for the current WLAN certificate, which has been imported into the AWK-1121. Nothing will be shown if a certificate is not available.

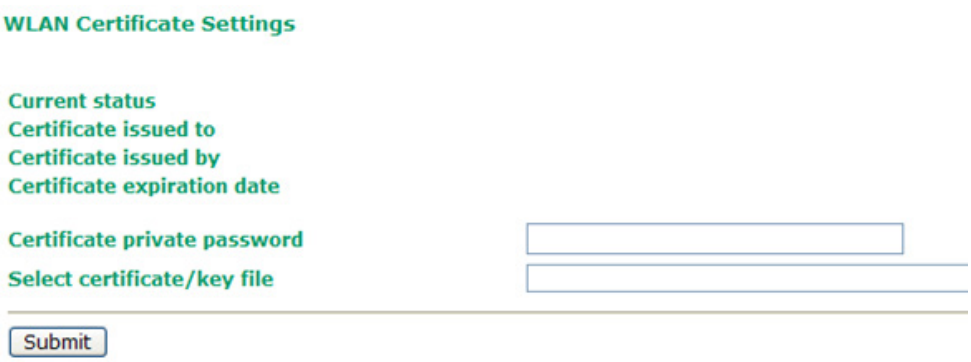
Certificate issued to: Shows the certificate user

Certificate issued by: Shows the certificate issuer

Certificate expiration date: Indicates when the certificate has expired

You can import a new WLAN certificate in ***Import WLAN Certificate*** by following these steps, in order:

1. Input the corresponding password (or key) in the **Certificate private password** field and then click **Submit** to set the password.
2. The password will be displayed in the Certificate private password field. Click on the **Browse** button in ***Select certificate/key file*** and select the certificate file.
3. Click **Upload Certificate File** to import the certificate file. If the import succeeds, you can see the information uploaded in ***Current status***. If it fails, you may need to return to step 1 to set the password correctly and then import the certificate file again.



NOTE The WLAN certificate will remain after the AWK-1121 reboots. Even though it is expired, it can still be seen on the ***Current status***.

Advanced Settings

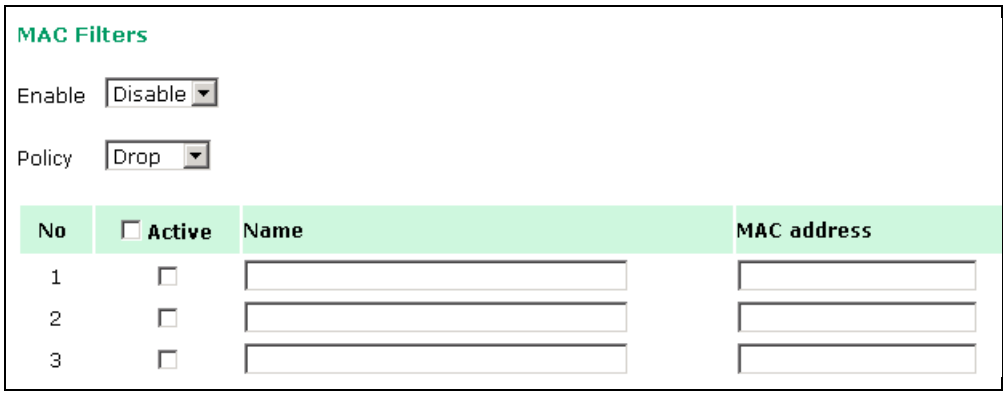
Several advanced functions are available to increase the functionality of your AWK-1121 and wireless network system. The DHCP server helps you deploy wireless clients efficiently. Packet filters provide security mechanisms, such as firewalls, in different network layers. Moreover, the AWK-1121 supports SNMP, making network management easier.

Packet Filters

The AWK-1121 includes various filters for **IP-based** packets going through LAN and WLAN interfaces. You can set these filters as a firewall to help enhance network security.

MAC Filter

The AWK-1121's MAC filter is a policy-based filter that can allow or filter out IP-based packets with specified MAC addresses. The AWK-1121 provides 8 entities for setting MAC addresses in your filtering policy. Remember to check the **Active** check box for each entity to activate the setting.



Enable

Setting	Description	Factory Default
Enable	Enables MAC filter	Disable
Disable	Disables MAC filter	

Policy

Setting	Description	Factory Default
Accept	Only the packets fitting the entities on list can be allowed.	Drop
Drop	Any packet fitting the entities on list will be denied.	

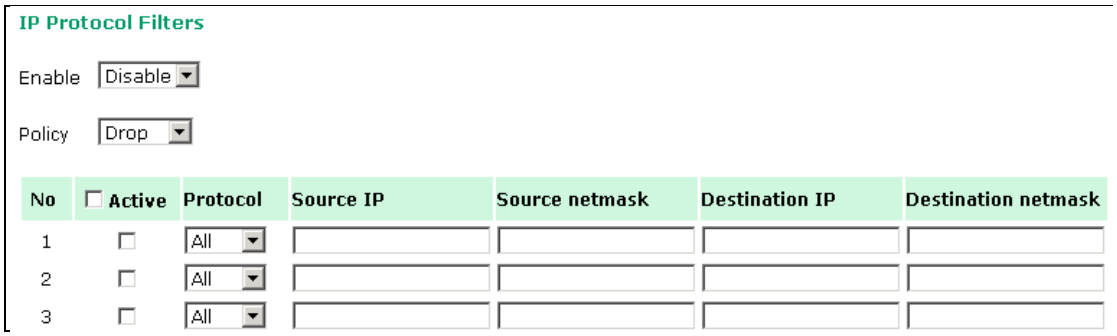
ATTENTION

Be careful when you enable the filter function:
Drop + "no entity on list is activated" = all packets are **allowed**
Accept + "no entity on list is activated" = all packets are **denied**

IP Protocol Filter

The AWK-1121's IP protocol filter is a policy-based filter that can allow or filter out IP-based packets with specified IP protocol and source/destination IP addresses.

The AWK-1121 provides 8 entities for setting IP protocol and source/destination IP addresses in your filtering policy. Four IP protocols are available: **All**, **ICMP**, **TCP**, and **UDP**. You must specify either the Source IP or the Destination IP. By combining IP addresses and netmasks, you can specify a single IP address or a range of IP addresses to accept or drop. For example, "IP address 192.168.1.1, netmask 255.255.255.255" refers to a sole IP address, while "IP address 192.168.1.1, netmask 255.255.255.0" refers to the range of IP addresses from 192.168.1.1 to 192.168.254. Remember to check the **Active** check box for each entity to activate the setting.



Enable

Setting	Description	Factory Default
Enable	Enables IP protocol filter	Disable
Disable	Disables IP protocol filter	

Policy

Setting	Description	Factory Default
Accept	Only the packets fitting the entities on the list can be allowed	Drop
Drop	Any packet fitting the entities on the list will be denied	

ATTENTION

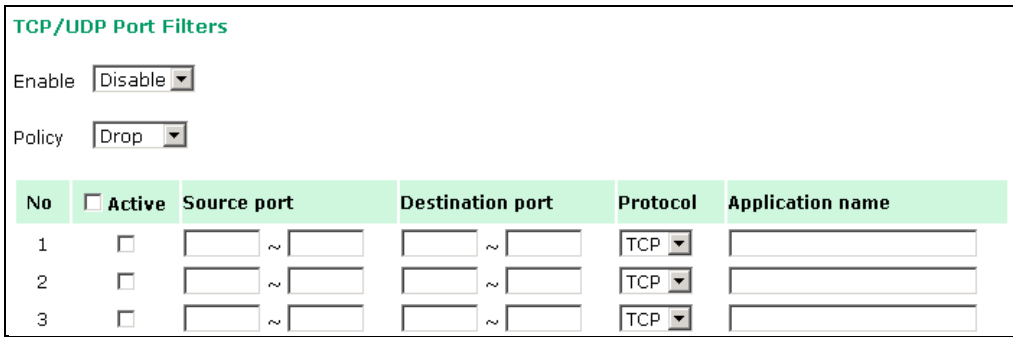
Be careful when you enable the filter function:
Drop + "no entity on list is activated" = all packets are **allowed.**
Accept + "no entity on list is activated" = all packets are **denied.**

TCP/UDP Port Filter

The AWK-1121's TCP/UDP port filter is a policy-based filter that can allow or filter out TCP/UDP-based packets with a specified source or destination port.

The AWK-1121 provides 8 entities for setting the range of source/destination ports of a specific protocol. In addition to selecting TCP or UDP protocol, you can set either the source port, destination port, or both. The end port can be left empty if only a single port is specified. Of course, the end port cannot be larger then the start port.

The **Application name** is a text string that describes the corresponding entity with up to 31 characters. Remember to check the **Active** check box for each entity to activate the setting.



Enable

Setting	Description	Factory Default
Enable	Enables TCP/UDP port filter	Disable
Disable	Disables TCP/UDP port filter	

Policy

Setting	Description	Factory Default
Accept	Only the packets fitting the entities on list can be allowed.	Drop
Drop	Any packet fitting the entities on list will be denied.	

ATTENTION

Be careful when you enable the filter function:
Drop + "no entity on list is activated" = all packets are **allowed**
Accept + "no entity on list is activated" = all packets are **denied**

SNMP Agent

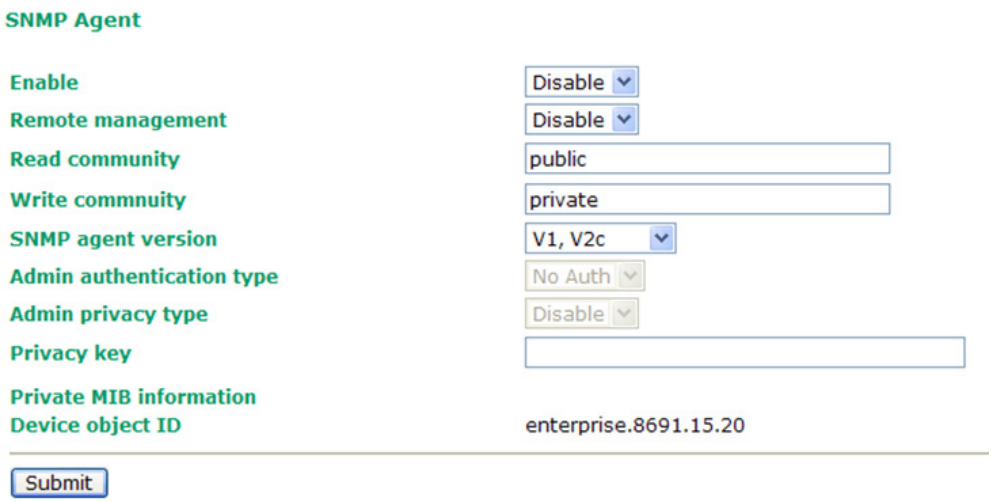
The AWK-1121 supports SNMP V1/V2c/V3. SNMP V1 and SNMP V2c use a community string match for authentication, which means that SNMP servers access all objects with read-only or read/write permissions using the community string *public*/*private* (default value). SNMP V3, which requires you to select an authentication level of MD5 or SHA, is the most secure protocol. You can also enable data encryption to enhance data security.

The AWK-1121's MIB can be found in the software CD and supports reading the attributes via SNMP. (Only ***get*** method is supported.)

SNMP security modes and security levels supported by the AWK-1121 are shown in the following table. Select the security mode and level that will be used to communicate between the SNMP agent and manager.

Protocol Version	Setting on UI web page	Authentication Type	Data Encryption	Method
SNMP V1, V2c	V1, V2c Read Community	Community string	No	Use a community string match for authentication
	V1, V2c Write/Read Community	Community string	No	Use a community string match for authentication
SNMP V3	No-Auth	No	No	Use account with admin or user to access objects
	MD5 or SHA	Authentication based on MD5 or SHA	No	Provides authentication based on HMAC-MD5, or HMAC-SHA algorithms. 8-character passwords are the minimum requirement for authentication.
	MD5 or SHA	Authentication based on MD5 or SHA	Data encryption key	Provides authentication based on HMAC-MD5 or HMAC-SHA algorithms, and data encryption key. 8-character passwords and a data encryption key are the minimum requirements for authentication and encryption.

The following parameters can be configured on the **SNMP Agent** page. A more detailed explanation of each parameter is given below the following figure.



Enable

Setting	Description	Factory Default
Enable	Enables SNMP Agent	Disabled
Disable	Disables SNMP Agent	

Remote Management

Setting	Description	Factory Default
Enable	Allow remote management via SNMP agent	Disabled
Disable	Disallow remote management via SNMP agent	

Read community (for V1, V2c)

Setting	Description	Factory Default
V1, V2c Read Community	Use a community string match with a maximum of 31 characters for authentication. This means that the SNMP agent can access all objects with read-only permissions using this community string.	public

Write community (for V1, V2c)

Setting	Description	Factory Default
V1, V2c Read /Write Community	Use a community string match with a maximum of 31 characters for authentication. This means that the SNMP agent can accesses all objects with read/write permissions using this community string.	private

SNMP agent version

Setting	Description	Factory Default
V1, V2c, V3, or V1, V2c, or V3 only	Select the SNMP protocol version used to manage the switch.	V1, V2c

Admin auth type (for V1, V2c, V3, and V3 only)

Setting	Description	Factory Default
No Auth	Use admin account to access objects. No authentication	No Authentication
MD5	Provide authentication based on the HMAC-MD5 algorithms. 8-character passwords are the minimum requirement for authentication.	
SHA	Provides authentication based on HMAC-SHA algorithms. 8-character passwords are the minimum requirement for authentication.	

Admin private key (for V1, V2c, V3, and V3 only)

Setting	Description	Factory Default
Disable	No data encryption	Disabled
DES	DES-based data encryption	
AES	AES-based data encryption	

Private key

A data encryption key is the minimum requirement for data encryption (maximum of 63 characters).

Private MIB Information Device Object ID

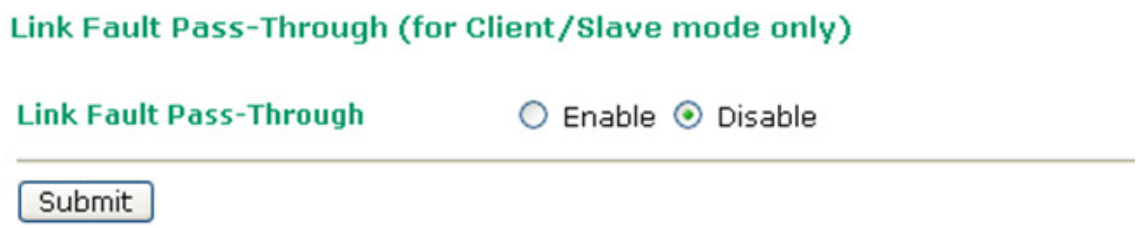
Also know as ***OID***. This is the AWK-1121's enterprise value. It is fixed.

Link Fault Pass-Through

This function means if Ethernet port is link down, wireless connection will be forced to disconnect. Once Ethernet link is recovered, AWK will try to connect to AP.

If wireless is disconnected, AWK restarts auto-negotiation on Ethernet port but always stays in the link failure state. Once the wireless connection is recovered, AWK will try to recover the Ethernet link.

System log will indicate the link fault pass through events in addition to the original link up/down events.



Link Fault Pass-Through

Setting	Description	Factory Default
Enable	Enables Link Fault Pass-Through	Disable
Disable	Disable Link Fault Pass-Through	

Auto Warning Settings

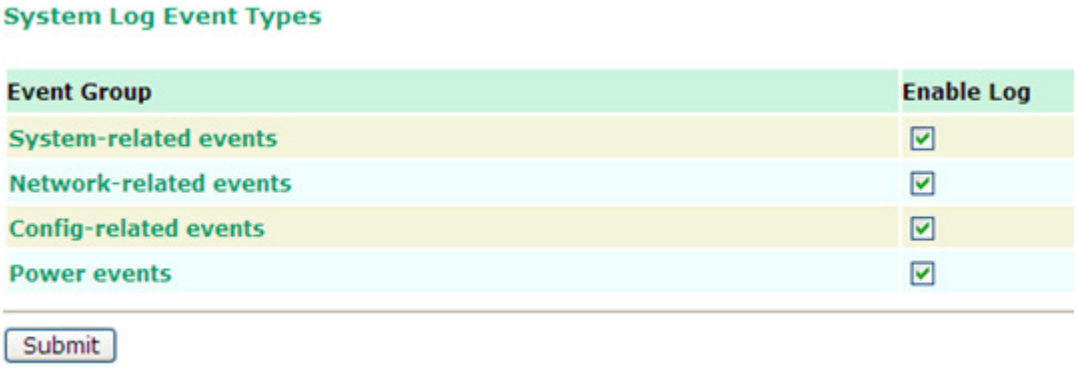
Since industrial-grade devices are often located at the endpoints of a system, these devices will not always know what is happening elsewhere on the network. This means that these devices, including wireless APs or clients, must provide system maintainers with real-time alarm messages. Even when system administrators are out of the control room for an extended period, they can still be informed of the status of devices almost instantaneously when exceptions occur.

In addition to logging these events, the AWK-1121 supports different approaches to warn engineers automatically, such as SNMP trap or e-mail.

System Log

System Log Event Types

Detailed information for grouped events is shown in the following table. You can check the box for "Enable Log" to enable groups of events. All values are enabled (checked) by default. The log for system events can be seen in Status → System Log.



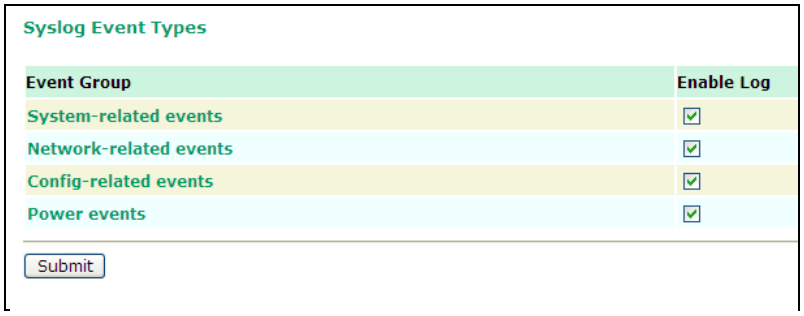
System-related events	Event is triggered when…
System restart (warm start)	The AWK-1121 is rebooted, such as when its settings are changed (IP address, subnet mask, etc.).
Network-related events	**Event is triggered when…**
LAN link on	The LAN port is connected to a device or network.
LAN link off	The port is disconnected (e.g., the cable is pulled out, or the opposing device shuts down).
WLAN connected to AP	The AWK-1121 is associated with an AP.
WLAN disconnected	The AWK-1121 is disassociated from an AP.
Config-related events	**Event is triggered when…**
Configuration Changed	A configuration item has been changed.
Configuration file import via Web Console	The configuration file is imported to the AWK-1121.
Console authentication failure	An incorrect password is entered.
Firmware upgraded	The AWK-1121's firmware is updated.
Power events	**Event is triggered when…**
Power 1/2 transition (On -> Off)	The AWK-1121 is powered down in PWR1/2.
PoE transition (On -> Off)	The AWK-1121 is powered down in PoE (PoE model only).
Power 1/2 transition (Off -> On)	The AWK-1121 is powered via PWR1/2.
PoE transition (Off -> On)	The AWK-1121 is powered via PoE (PoE model only).

Syslog

This function provides the event logs for the Syslog server. The function supports up to three configurable Syslog servers and Syslog server UDP port numbers. When an event occurs, the event will be sent as a Syslog UDP packet to the specified Syslog servers.

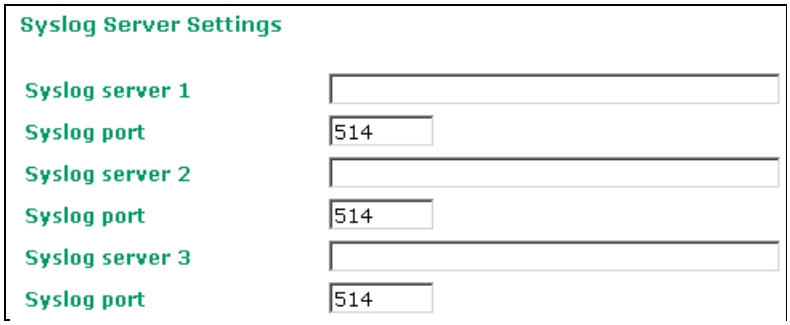
Syslog Event Types

Detailed information for grouped events is shown in the following table. You can check the box for "Enable Log" to enable groups of events. All values are enabled (checked) by default. Details for each event group can be found on the table "System Log Event Types", just above, on page 3-23.



Syslog Server Settings

You can configure the parameters for your Syslog servers in this page.



Syslog server 1/ 2/ 3

Setting	Description	Factory Default
IP address	Enter the IP address of the 1st/ 2nd/ 3rd Syslog Server	None

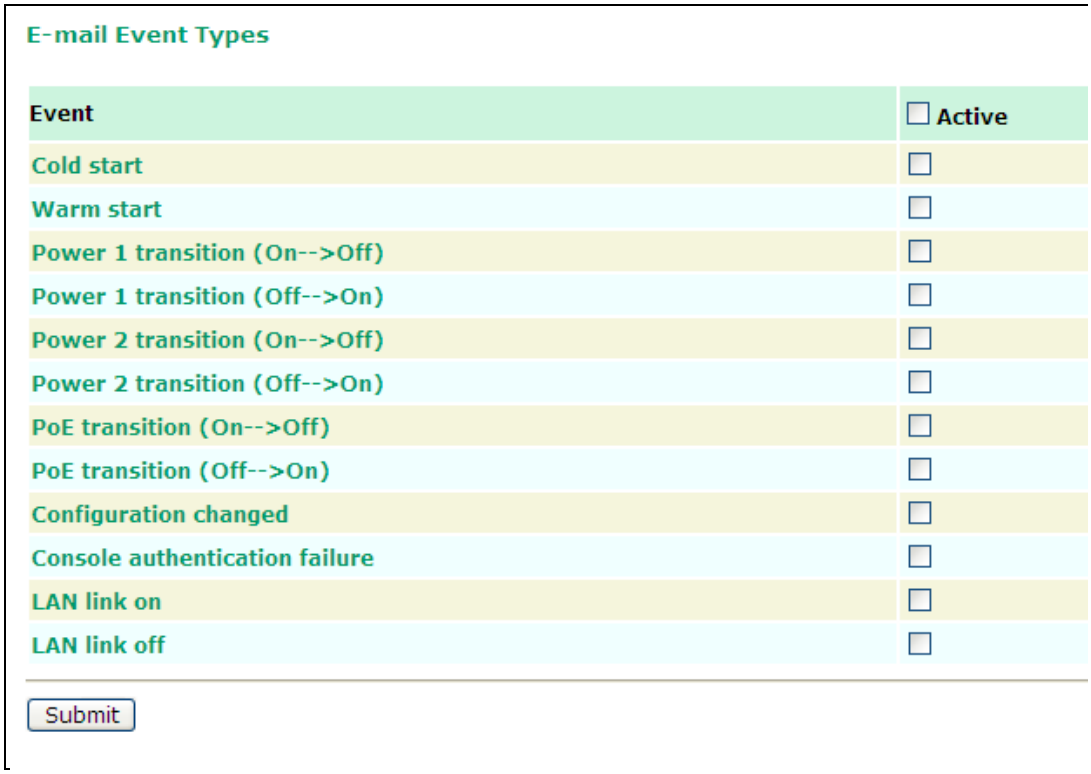
Syslog port

Setting	Description	Factory Default
Port destination (1 to 65535)	Enter the UDP port of the corresponding Syslog server	514

E-mail

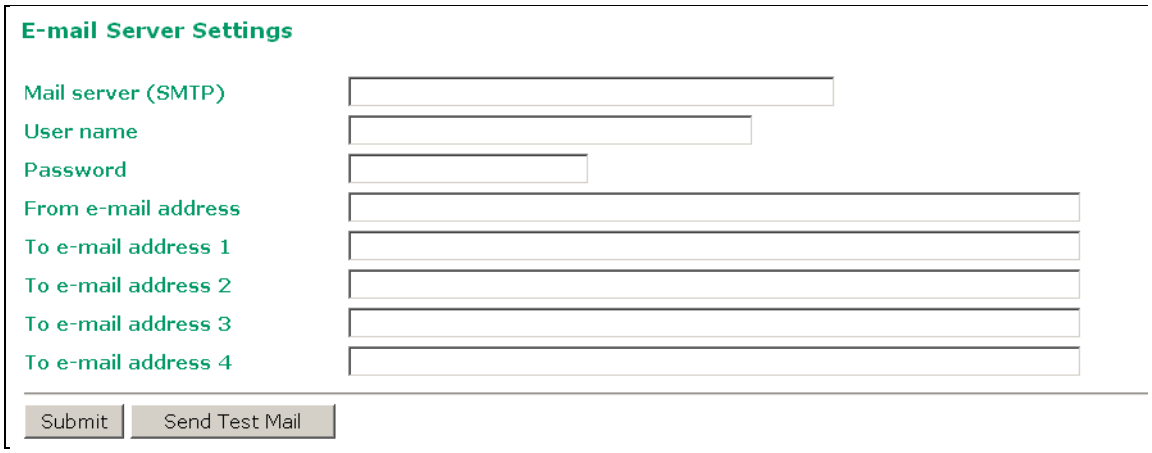
E-mail Event Types

Check the box for **Active** to enable the event items. All default values are deactivated (unchecked). Details for each event item can be found on the "System log Event Types" table on page 3-23.



E-mail Server Settings

You can set up to 4 e-mail addresses to receive alarm emails from the AWK-1121. The following parameters can be configured on the **E-mail Server Settings** page. In addition, a **Send Test Mail** button can be used to test whether the Mail server and e-mail addresses work well. More detailed explanations about these parameters are given after the following figure.



Mail server (SMTP)

Setting	Description	Factory Default
IP address	The IP Address of your email server.	None

User name & Password

Setting	Description	Factory Default
Max. 63 chars	User name and password used in the SMTP server	None

From e-mail address

Setting	Description	Factory Default
Max. 63 characters	Enter the administrator's e-mail address which will be shown in the "From" field of a warning e-mail.	None

To E-mail address 1/ 2/ 3/ 4

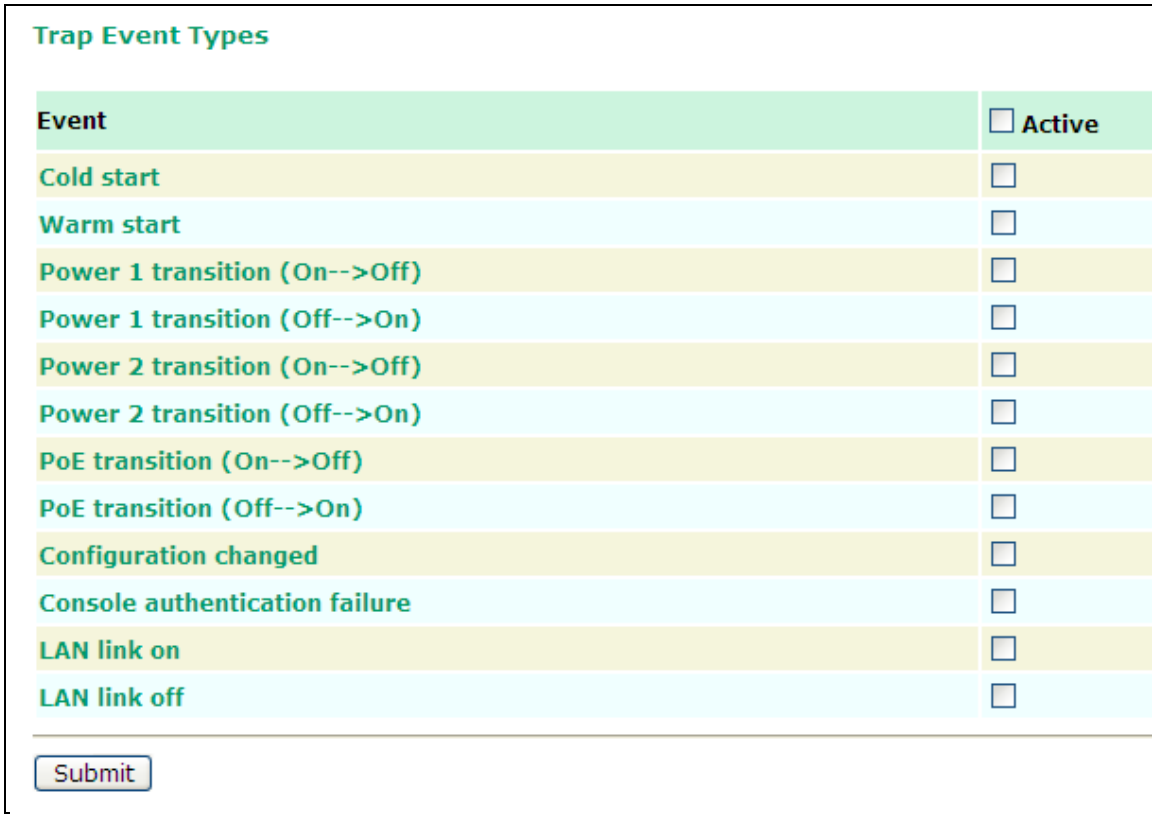
Setting	Description	Factory Default
Max. 63 characters	Enter the receivers' e-mail addresses.	None

Trap

Traps can be used to signal abnormal conditions (notifications) to a management station. This trap-driven notification can make your network more efficient.

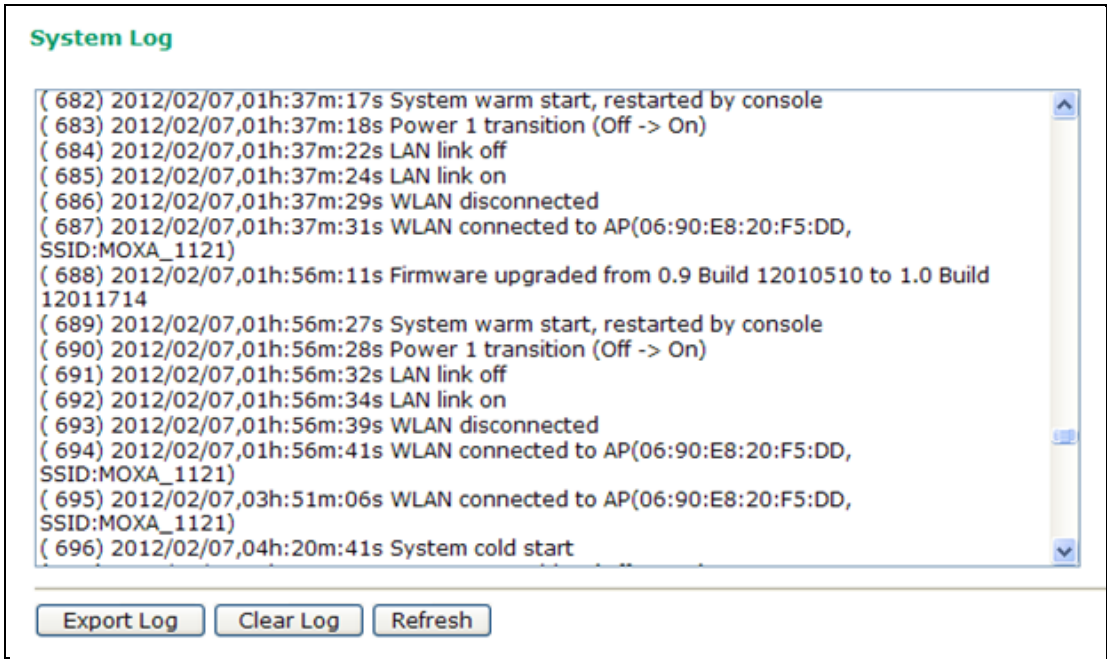
Because a management station usually takes care of a large number of devices that have a large number of objects, it will be overloading for the management station to poll or send requests to query every object on every device. It would be better if the managed device agent could notify the management station by sending a message known as a trap for the event.

Trap Event Types



SNMP Trap Receiver Settings

SNMP traps are defined in SMIv1 MIBs (SNMPv1) and SMIv2 MIBs (SNMPv2c). The two styles are basically equivalent, and it is possible to convert between the two. You can set the parameters for SNMP trap receivers through the web page.


System Log
(682) 2012/02/07,01h:37m:17s System warm start, restarted by console
(683) 2012/02/07,01h:37m:18s Power 1 transition (Off -> On)
(684) 2012/02/07,01h:37m:22s LAN link off
(685) 2012/02/07,01h:37m:24s LAN link on
(686) 2012/02/07,01h:37m:29s WLAN disconnected
(687) 2012/02/07,01h:37m:31s WLAN connected to AP(06:90:E8:20:F5:DD, SSID:MOXA_1121)
(688) 2012/02/07,01h:56m:11s Firmware upgraded from 0.9 Build 12010510 to 1.0 Build 12011714
(689) 2012/02/07,01h:56m:27s System warm start, restarted by console
(690) 2012/02/07,01h:56m:28s Power 1 transition (Off -> On)
(691) 2012/02/07,01h:56m:32s LAN link off
(692) 2012/02/07,01h:56m:34s LAN link on
(693) 2012/02/07,01h:56m:39s WLAN disconnected
(694) 2012/02/07,01h:56m:41s WLAN connected to AP(06:90:E8:20:F5:DD, SSID:MOXA_1121)
(695) 2012/02/07,03h:51m:06s WLAN connected to AP(06:90:E8:20:F5:DD, SSID:MOXA_1121)
(696) 2012/02/07,04h:20m:41s System cold start
Export Log
Clear Log
Refresh

1st / 2nd Trap version

Setting	Description	Factory Default
V1	SNMP trap defined in SNMPv1	V1
V2	SNMP trap defined in SNMPv2	

1st / 2nd Trap server IP/name

Setting	Description	Factory Default
IP address or host name	Enter the IP address or name of the trap server used by your network.	None

1st / 2nd Trap community

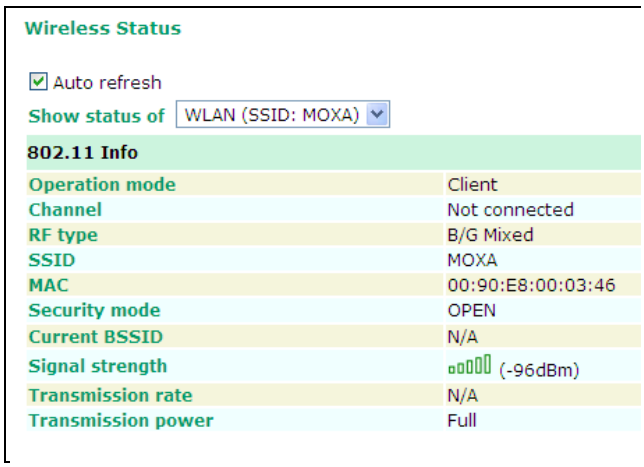
Setting	Description	Factory Default
Max. of 31 characters	Use a community string match with a maximum of 31 characters for authentication.	alert

Status

Wireless Status

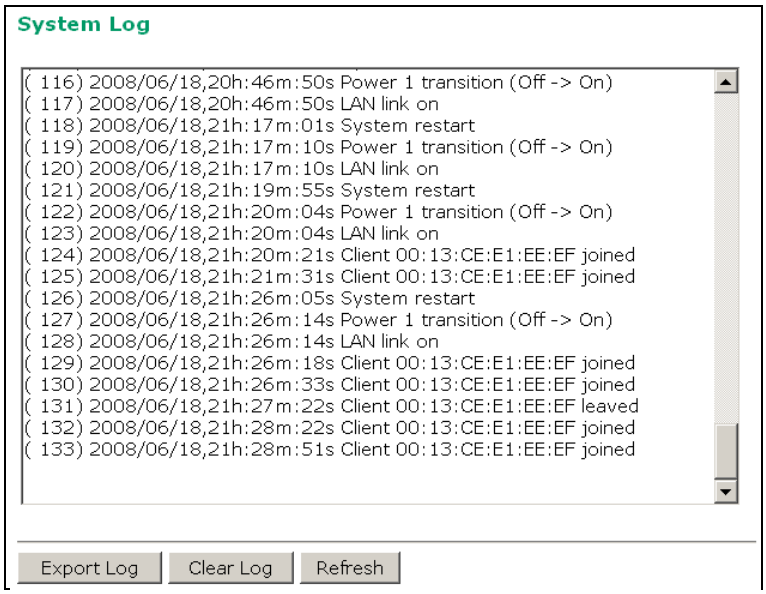
The status for **802.11 Info** parameters, such as Operation mode and Channel, are shown on the **Wireless Status** page. The status will refresh every 5 seconds if the **Auto refresh** box is checked.

It is helpful to use the continuously updated information on this page, such as **Signal strength**, to monitor the signal strength of the AWK-1121 in Client mode.



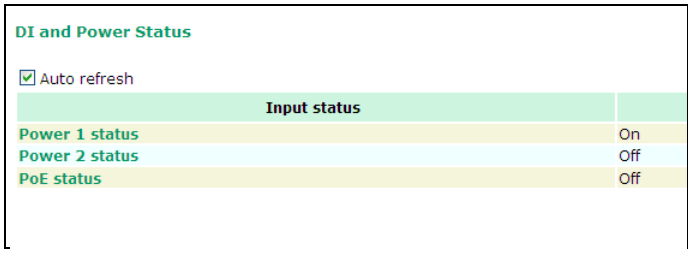
System Log

Triggered events are recorded in System Log. You can export the log contents to an available viewer by clicking **Export Log**. You can use the **Clear Log** button to clear the log contents and the **Refresh** button to refresh the log.


System Log
(116) 2008/06/18,20h:46m:50s Power 1 transition (Off -> On)
(117) 2008/06/18,20h:46m:50s LAN link on
(118) 2008/06/18,21h:17m:01s System restart
(119) 2008/06/18,21h:17m:10s Power 1 transition (Off -> On)
(120) 2008/06/18,21h:17m:10s LAN link on
(121) 2008/06/18,21h:19m:55s System restart
(122) 2008/06/18,21h:20m:04s Power 1 transition (Off -> On)
(123) 2008/06/18,21h:20m:04s LAN link on
(124) 2008/06/18,21h:20m:21s Client 00:13:CE:E1:EE:EF joined
(125) 2008/06/18,21h:21m:31s Client 00:13:CE:E1:EE:EF joined
(126) 2008/06/18,21h:26m:05s System restart
(127) 2008/06/18,21h:26m:14s Power 1 transition (Off -> On)
(128) 2008/06/18,21h:26m:14s LAN link on
(129) 2008/06/18,21h:26m:18s Client 00:13:CE:E1:EE:EF joined
(130) 2008/06/18,21h:26m:33s Client 00:13:CE:E1:EE:EF joined
(131) 2008/06/18,21h:27m:22s Client 00:13:CE:E1:EE:EF leaved
(132) 2008/06/18,21h:28m:22s Client 00:13:CE:E1:EE:EF joined
(133) 2008/06/18,21h:28m:51s Client 00:13:CE:E1:EE:EF joined
Export Log
Clear Log
Refresh

Power Status

The status of power inputs is shown on this web page. The status will refresh every 5 seconds if the **Auto refresh** box is checked.

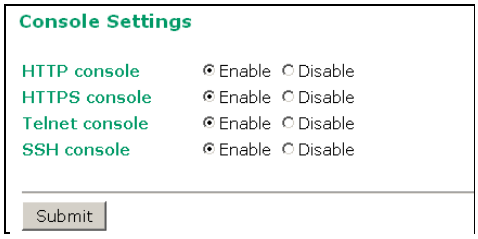


Maintenance

Maintenance functions provide the administrator with tools to manage the AWK-1121 and wired/wireless networks.

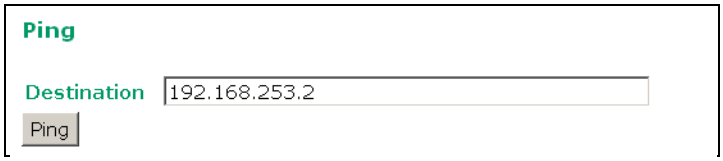
Console Settings

You can enable or disable access permission for the following consoles: HTTP, HTTPS, Telnet and SSH connections. For more security, we recommend you only allow access to the two secured consoles, HTTPS and SSH.

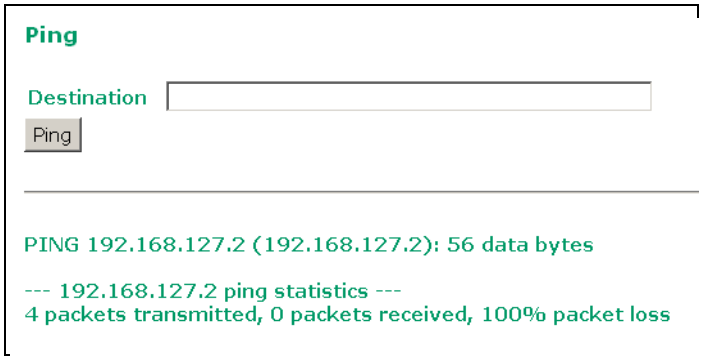


Ping

Ping helps to diagnose the integrity of wired or wireless networks. By inputting a node's IP address in the **Destination** field, you can use the **ping** command to make sure it exists and whether or not the access path is available.



If the node and access path are available, you will see that all packets were successfully transmitted with no loss. Otherwise, some, or even all, packets may get lost, as shown in the following figure.

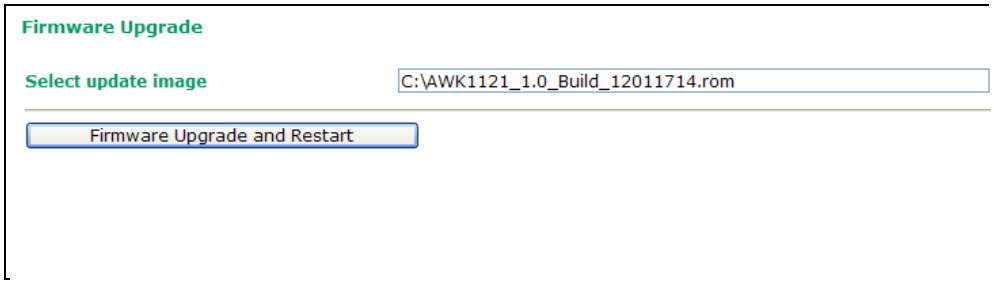


Firmware Upgrade

The AWK-1121 can be enhanced with more value-added functions by installing firmware upgrades. The latest firmware is available at Moxa's download center.

Before running a firmware upgrade, make sure the AWK-1121 is off-line. Click the **Browse** button to specify the firmware image file and click **Firmware Upgrade and Restart** to start the firmware upgrade. After the progress bar reaches 100%, the AWK-1121 will reboot itself.

When upgrading your firmware, the AWK-1121's other functions are forbidden.



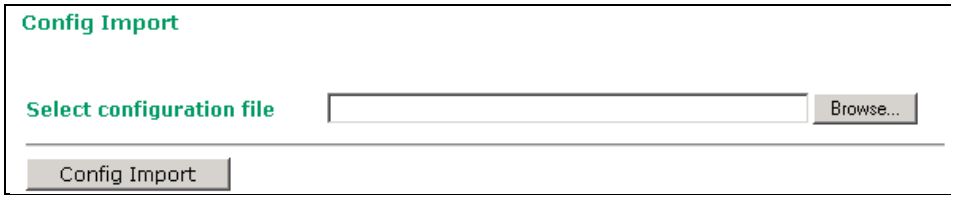
ATTENTION

Please make sure the power source is stable when you upgrade your firmware. An unexpected power breakup may damage your AWK-1121.

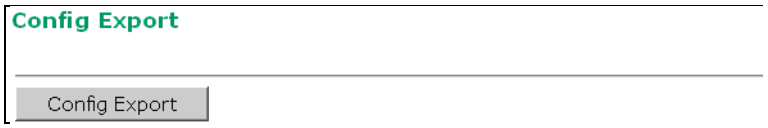
Config Import/Export

You can back up or restore the AWK-1121's configuration with **Config Import/Export**.

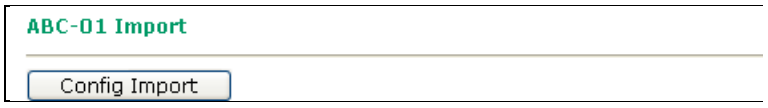
In the **Config Import** section, click **Browse** to specify the configuration file and click **Config Import** button to begin importing the configuration.

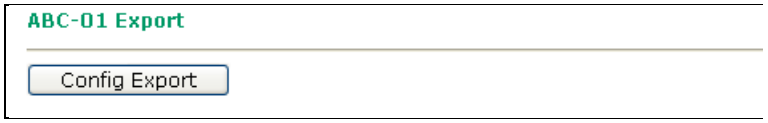


In the **Config Export** section, click the **Config Export** button and save the configuration file onto your local storage media. The configuration file is a text file and you can view and edit it with a general text-editing tool.



You can also do automated device back ups or setup restoration using Moxa's dedicated configuration import-export accessory, the **ABC-01** (HW Rev. 1.1 support only).





To download the configuration to the AWK device:

i. Turn off the AWK device.

ii. Plug in the ABC-01 to the AWK's console, via the RS-232 port.

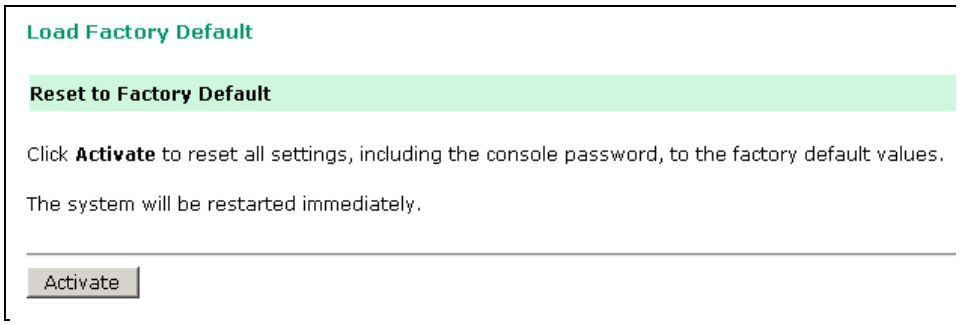
iii. Turn on the AWK device.

iv. The AWK device will automatically detect the ABC-01 during the boot process, and will automatically download the configuration file from the ABC-01 to the AWK. Once the configuration downloads, then-if the configuration format is correct-the AWK will emit three short beeps and continue the boot process.

v. Once the AWK has booted up successfully, it will emit the normal two beeps and the "Ready" LED will turn to solid green.

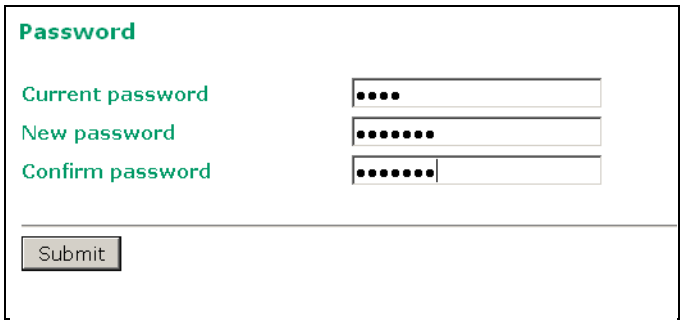
Load Factory Defaults

Use this function to reset the AWK-1121 and roll all settings back to the factory default values. You can also reset the hardware by pressing the reset button on the rear panel of the AWK-1121.


Load Factory Default
Reset to Factory Default
Click Activate to reset all settings, including the console password, to the factory default values.
The system will be restarted immediately.
Activate

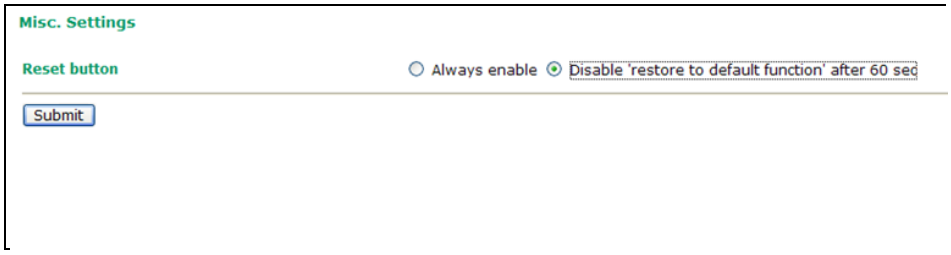
Password

You can change the administration password for each of the AWK-1121's console managers by using the **Password** function. Before you set up a new password, you must input the current password and reenter the new password for confirmation. For your security, do not use the default password ***root***, and remember to change the administration password regularly.



Misc. Settings

Additional settings to help you manage your AWK-1121, are available on this page.



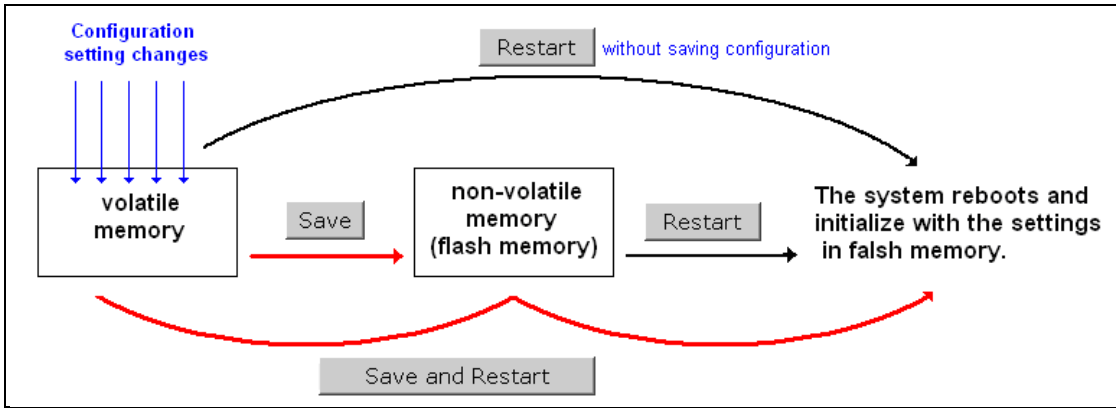
Reset button

Setting	Description	Factory Default
Always enabled	The AWK-1121's Reset button works normally.	Always enabled
Disabled 60 sec after boot-up	The AWK-1121's "reset to defaults" function will go inactive 60 seconds after the AWK-1121 finishes booting up.	

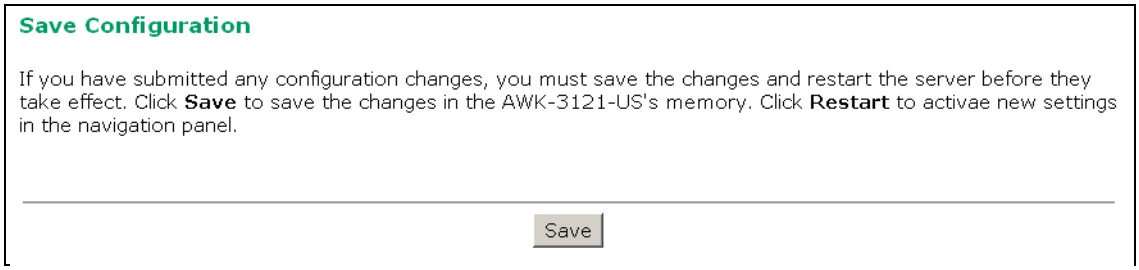
Save Configuration

The following figure shows how the AWK-1121 stores the setting changes into volatile and non-volatile memory. All data stored in volatile memory will disappear when the AWK-1121 is shutdown or rebooted unless they are saved in non-volatile memory. Because the AWK-1121 starts up and initializes with the settings stored in flash memory, all new changes must be saved to flash memory before restarting the AWK-1121.

This also means that new changes will not take effect unless you press the "Save and Restart" button.



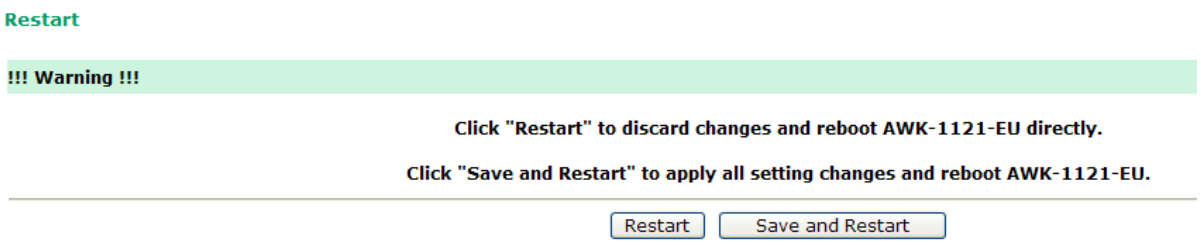
After you click on **Save Configuration** in the left menu box, the following screen will appear. Click **Save** if you wish to update the configuration settings in the flash memory at this time. Alternatively, you may choose to run other functions and put off saving the configuration until later. However, the new setting changes will remain in the non-volatile memory until you save the configurations.


Save Configuration
If you have submitted any configuration changes, you must save the changes and restart the server before they take effect. Click Save to save the changes in the AWK-3121-US's memory. Click Restart to activae new settings in the navigation panel.
Save

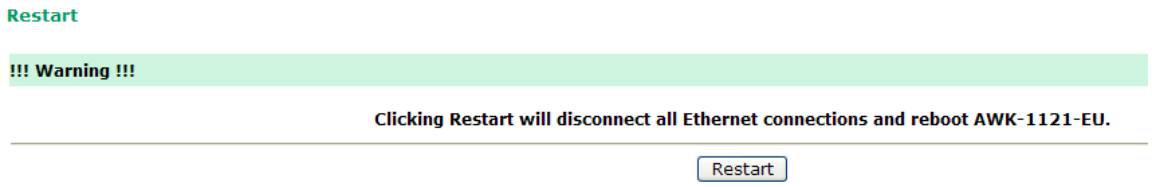
Restart

If you submitted configuration changes, you will find a blinking string in the upper right corner of the screen. After making all your changes, click the **Restart** function in the left menu box. One of two different screens will appear.

If you made changes recently but did not save, you will be given two options. Clicking the **Restart** button here will reboot the AWK-1121 directly, and all setting changes will be ignored. Clicking the **Save and Restart** button will apply all setting changes and then reboot the AWK-1121.


Restart
!!! Warning !!!
Click "Restart" to discard changes and reboot AWK-1121-EU directly.
Click "Save and Restart" to apply all setting changes and reboot AWK-1121-EU.
Restart
Save and Restart

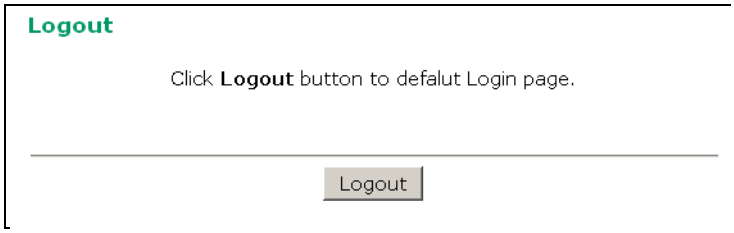
If you run the **Restart** function without changing any configurations or saving all your changes, you will see just one **Restart** button on your screen.



You will not be able to run any of the AWK-1121's functions while the system is rebooting.

Logout

Logout helps users disconnect the current HTTP or HTTPS session and go to the Login page. For security reasons, we recommend you logout before quitting the console manager.



4

Software Installation and Configuration

The following topics are covered in this chapter:

- **Overview**
- **AWK Search Utility**
  - Installing AWK Search Utility
  - Configuring the AWK Search Utility

Overview

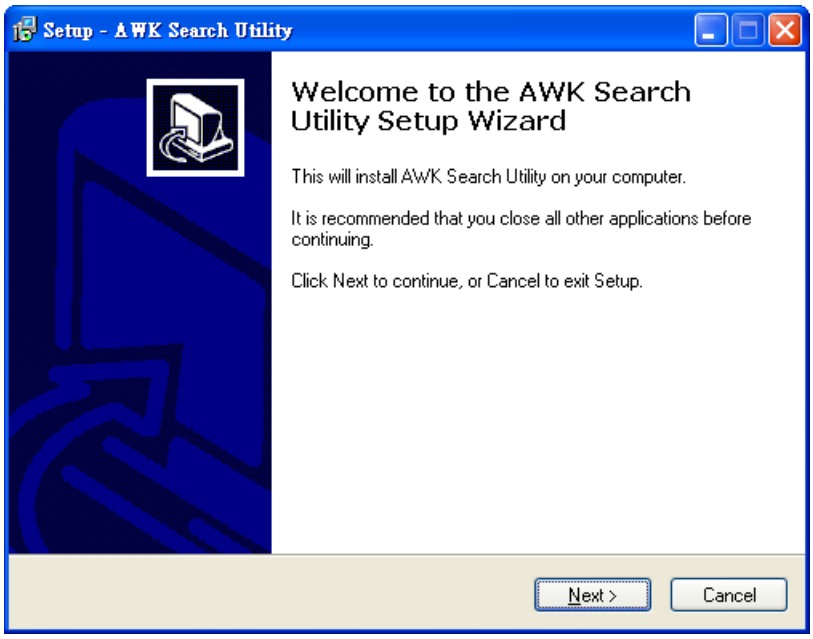
The Documentation & Software CD included with your AWK-1121 is designed to make the installation and configuration procedure easy and straightforward. This auto-run CD includes AWK Search Utility (to broadcast search for all AWK's accessible over the network), the AWK-1121 User's Manual, and Quick Installation Guide.

AWK Search Utility

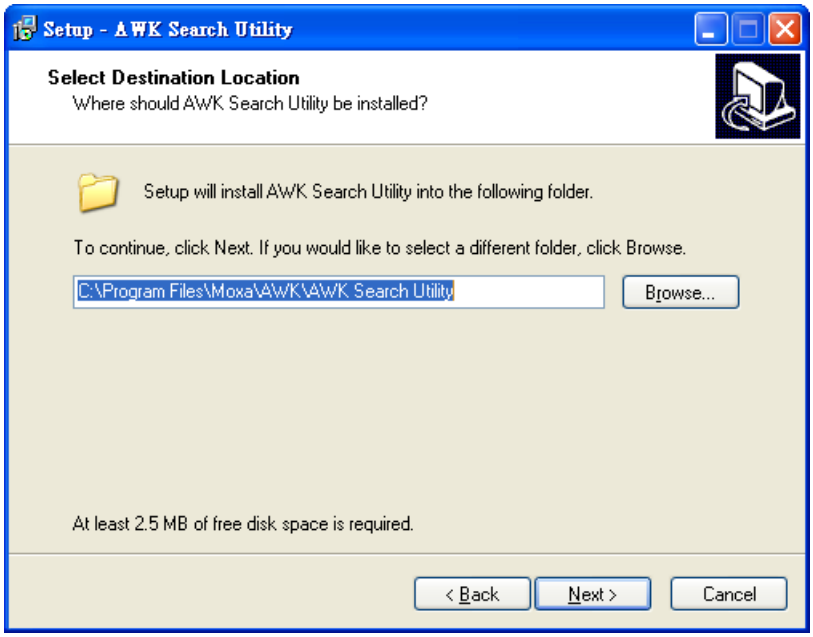
Installing AWK Search Utility

Click the **INSTALL UTILITY** button in the AWK Installation CD auto-run window to install AWK Search Utility. Once the program starts running, click **Yes** to proceed.

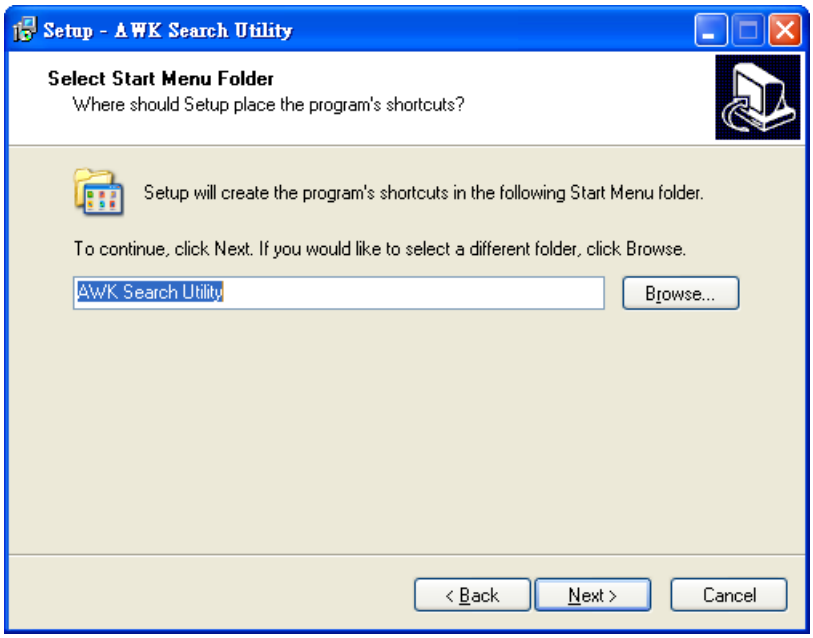
1. Click **Next** when the **Welcome** screen opens to proceed with the installation.


Setup - AWK Search Utility
Welcome to the AWK Search Utility Setup Wizard
This will install AWK Search Utility on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel

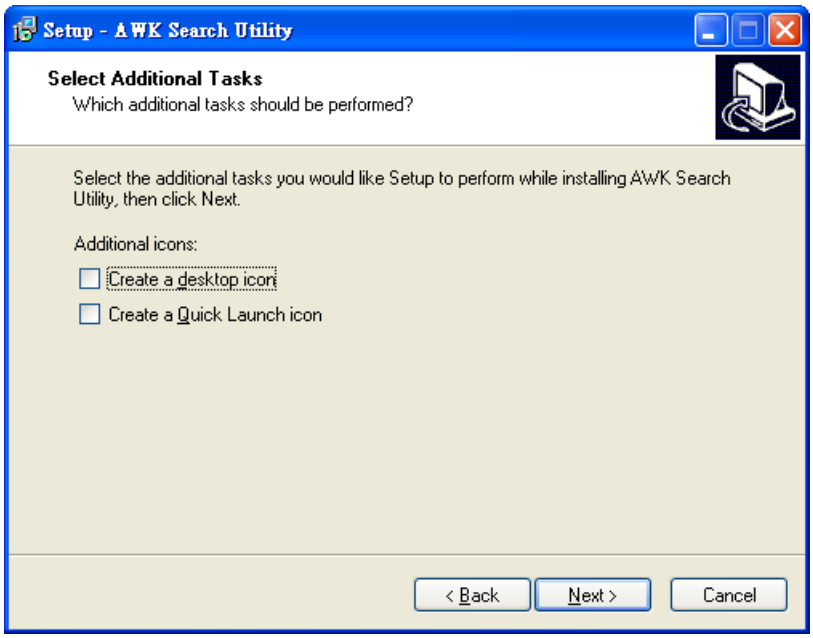
2. Click **Next** to install program files to the default directory, or click **Browse** to select an alternate location.


Setup - AWK Search Utility
Select Destination Location
Where should AWK Search Utility be installed?
Setup will install AWK Search Utility into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Program Files\Moxa\AWK\AWK Search Utility
Browse...
At least 2.5 MB of free disk space is required.
< Back
Next >
Cancel

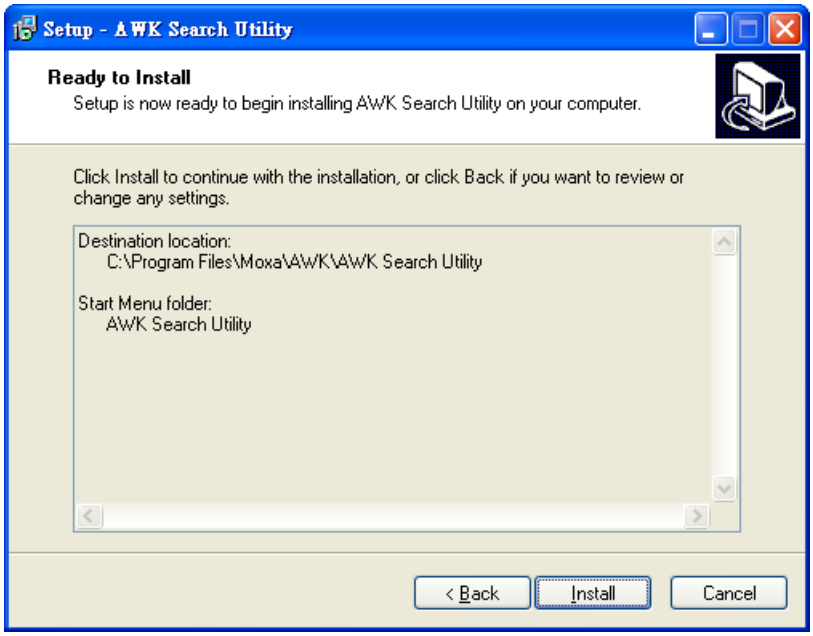
3. Click **Next** to create the program's shortcut files to the default directory, or click **Browse** to select an alternate location.


Setup - AWK Search Utility
Select Start Menu Folder
Where should Setup place the program's shortcuts?
Setup will create the program's shortcuts in the following Start Menu folder.
To continue, click Next. If you would like to select a different folder, click Browse.
AWK Search Utility
Browse...
< Back
Next >
Cancel

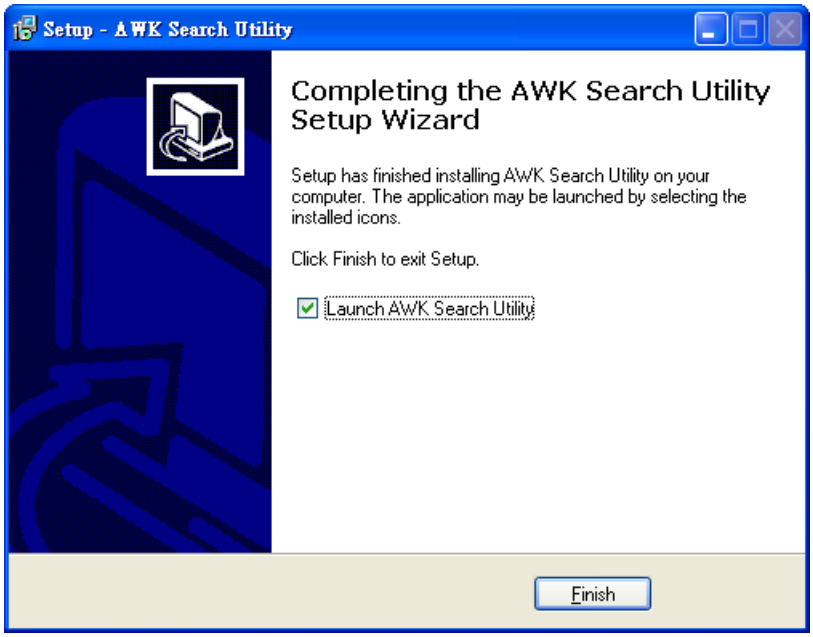
4. Click **Next** to select additional tasks.


Setup - AWK Search Utility
Select Additional Tasks
Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing AWK Search Utility, then click Next.
Additional icons:
Create a desktop icon
Create a Quick Launch icon
< Back
Next >
Cancel

5. The installer then displays a summary of the installation options.


Setup - AWK Search Utility
Ready to Install
Setup is now ready to begin installing AWK Search Utility on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Destination location:
C:\Program Files\Moxa\AWK\AWK Search Utility
Start Menu folder:
AWK Search Utility
< Back
Install
Cancel

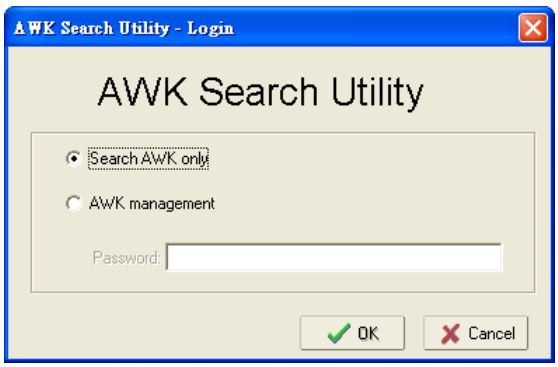
6. Click **Install** to begin the installation. The setup window will report the progress of the installation. To change the installation settings, click **Back** and navigate to the previous screen.
7. Click **Finish** to complete the installation of AWK Search Utility.


Setup - AWK Search Utility
Completing the AWK Search Utility Setup Wizard
Setup has finished installing AWK Search Utility on your computer. The application may be launched by selecting the installed icons.
Click Finish to exit Setup.
Launch AWK Search Utility
Finish

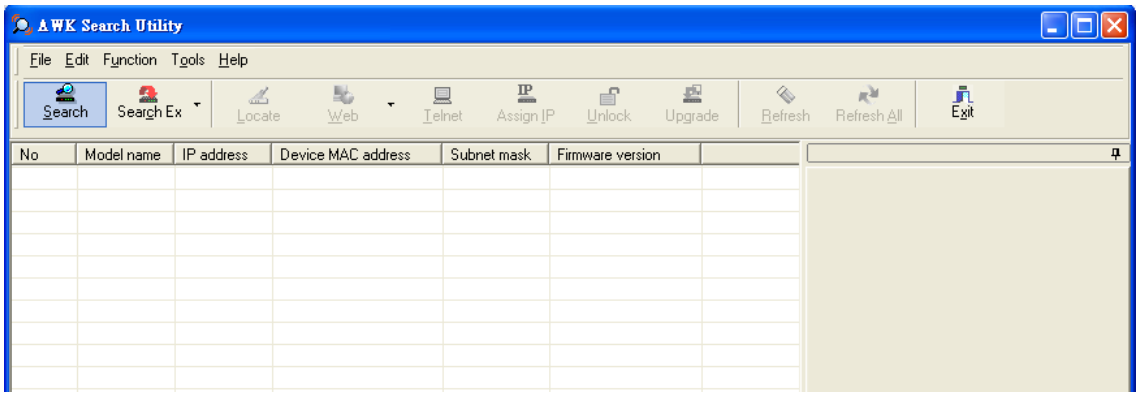
Configuring the AWK Search Utility

The Broadcast Search function is used to locate all AWK-1121 APs that are connected to the same LAN as your computer. After locating an AWK-1121, you will be able to change its IP address. Since the Broadcast Search function searches by TCP packet and not IP address, it doesn't matter if the AWK-1121 is configured as an AP or Client. In either case, APs and Clients connected to the LAN will be located, regardless of whether or not they are part of the same subnet as the host.

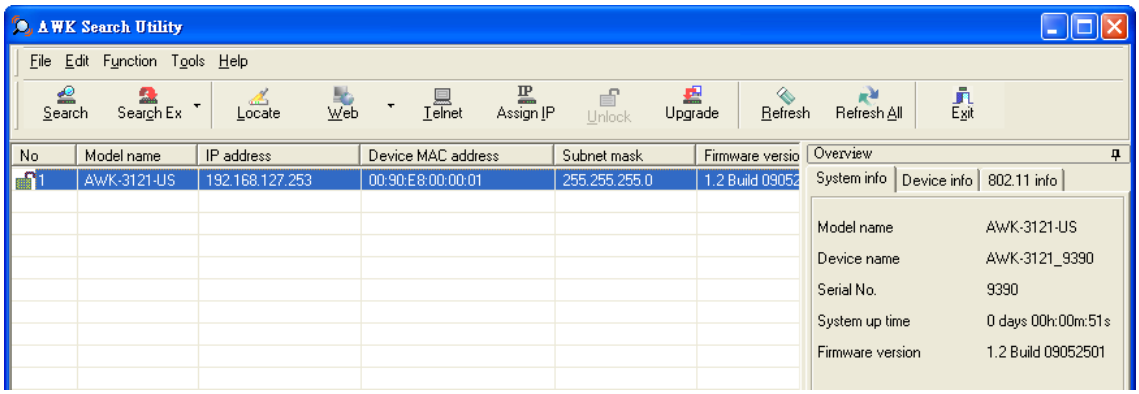
1. Start the **AWK Search Utility** program. When the Login page appears, select the "Search AWK only" option to search for AWKs and to view each AWK's configuration. Select the "AWK management" option to assign IPs, upgrade firmware, and locate devices.



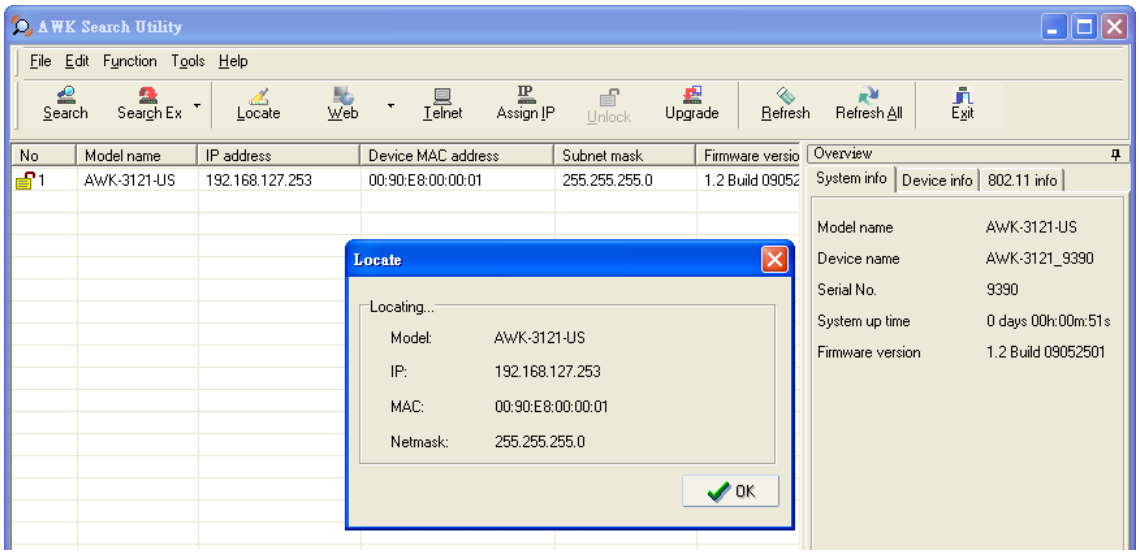
2. Open the AWK Search Utility and then click the **Search** icon.



3. The "Searching" window indicates the progress of the search. When the search is complete, all AWKs that were located will be displayed in the AWK Search Utility window.

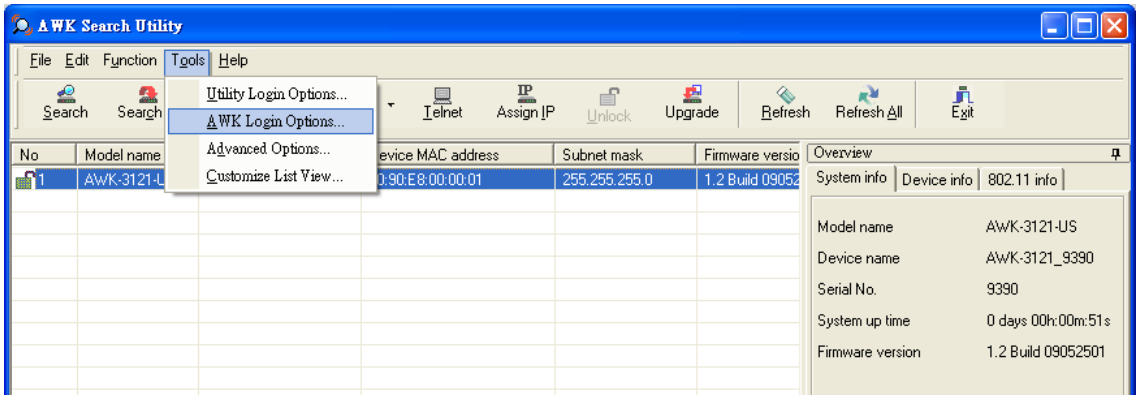


4. Click **Locate** to cause the selected device to beep.



5. Make sure your AWK is **unlocked** before using the search utility's icons setting. The AWK will unlock automatically if the password is set to the default. Otherwise you must enter the new password manually.

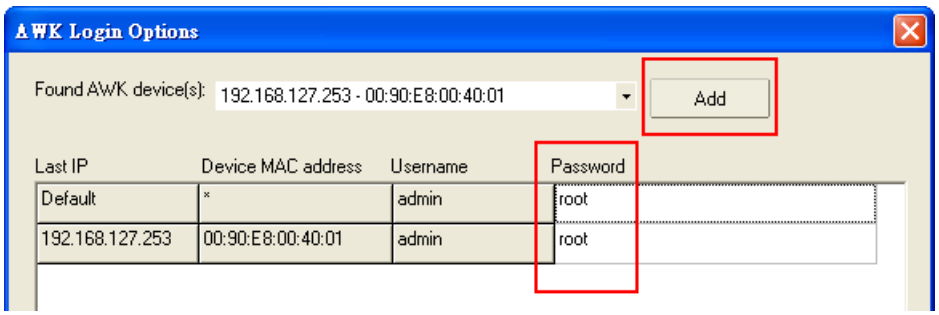
6. Go to **Tools → AWK login Options** to manage and unlock additional AWKs.



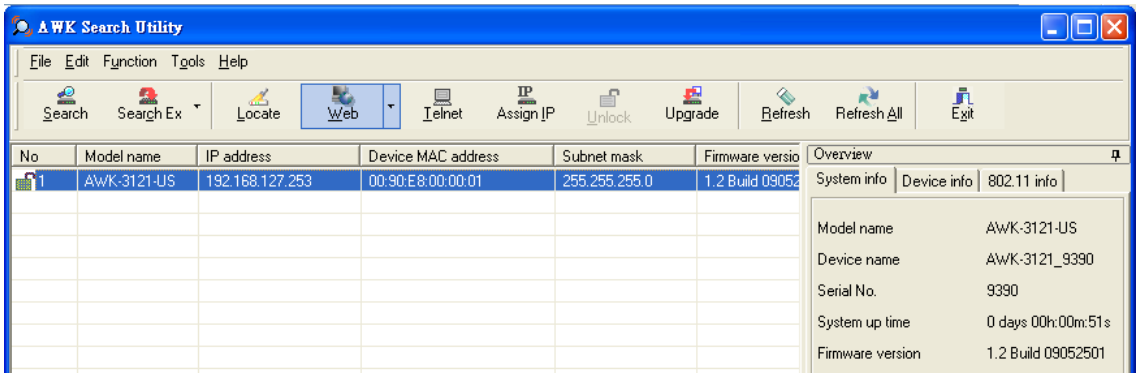
7. Use the scroll down list to select the MAC addresses of those AWKs you would like to manage, and then click **Add**. Key in the password for the AWK device and then click **OK** to save. If you return to the search page and search for the AWK again, you will find that the AWK will unlock automatically.

ATTENTION

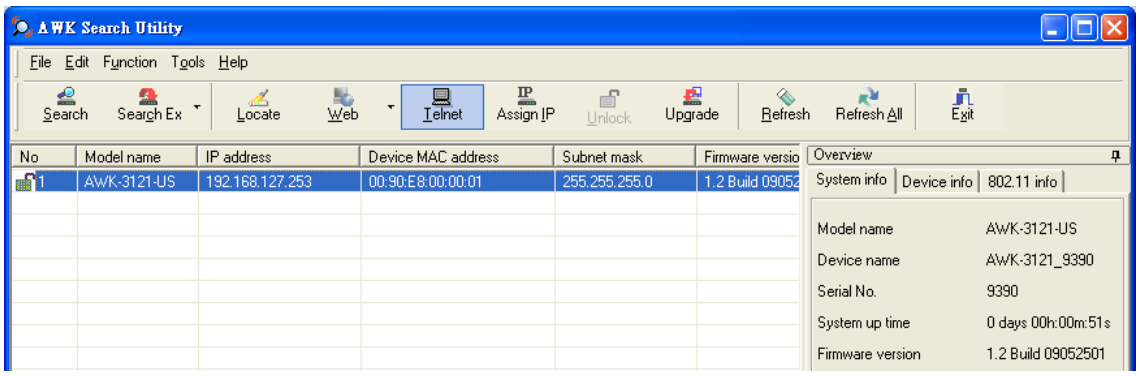
For security purposes, we suggest you can change the AWK search utility login password instead of using the default.



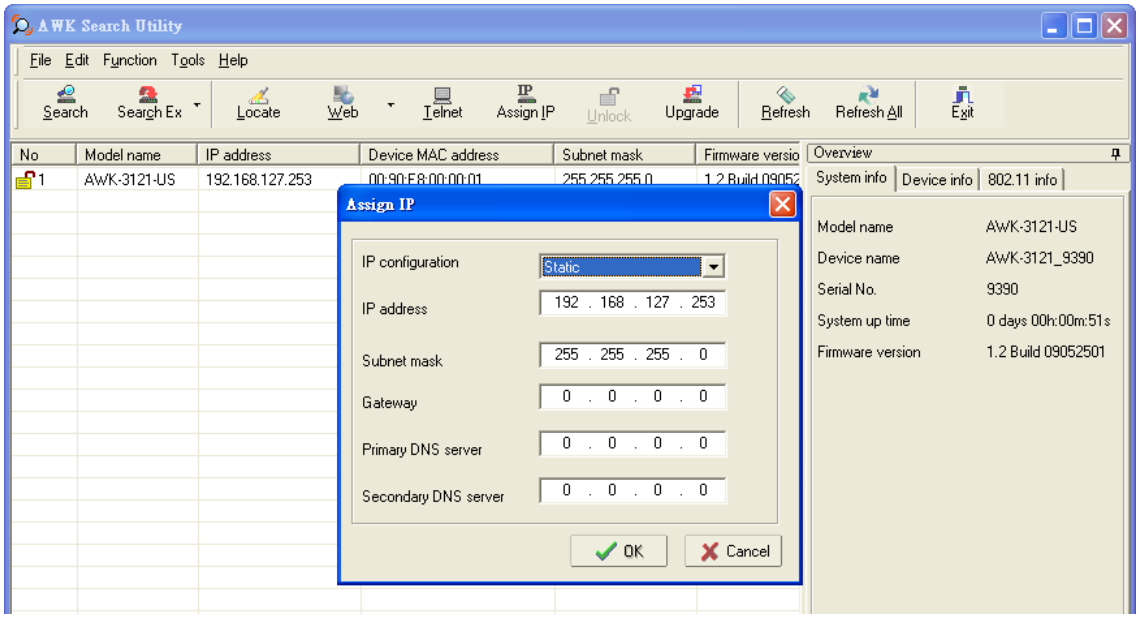
To modify the configuration of the highlighted AWK, click on the Web icon to open the web console. This will take you to the web console, where you can make all configuration changes. Refer to Chapter 3, "Using the Web Console," for information on how to use the web console.



Click on **Telnet** if you would like to use telnet to configure your AWKs.



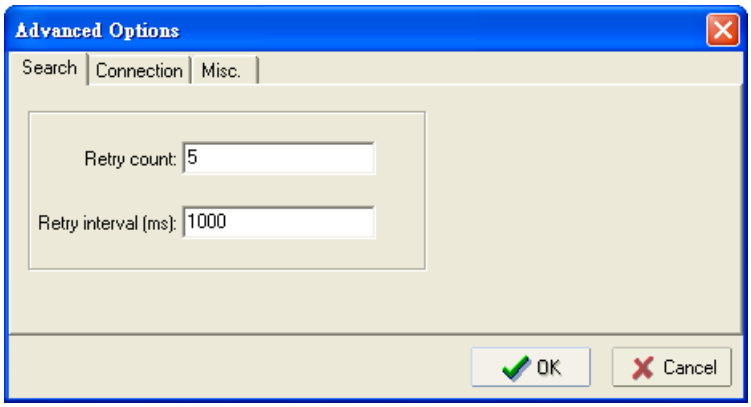
Click **Assign IP** to change the IP setting.



The three advanced options—**Search**, **Connection**, and **Miscellaneous**—are explained below:

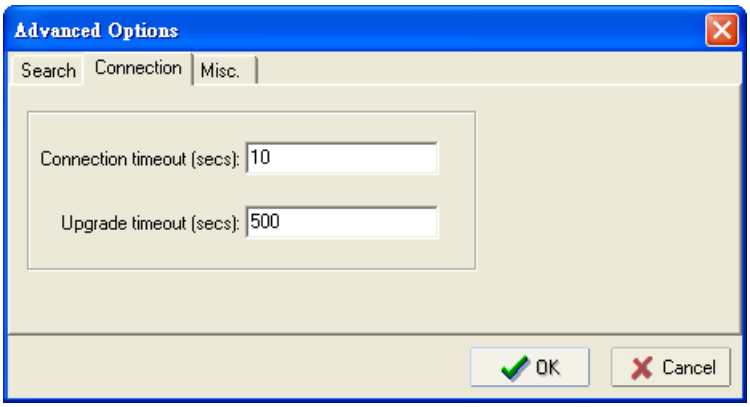
Search

- **Retry count (default=5):** Indicates how many times the search will be retried automatically.
- **Retry interval (ms):** The time lapsed between retries.



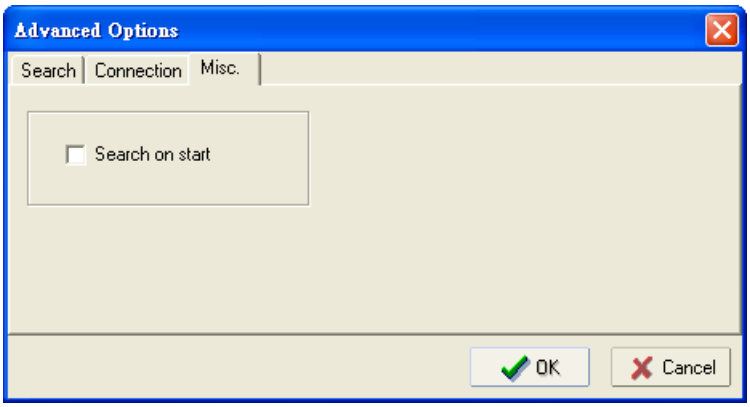
Connection

- **Connection timeout (secs):** Use this option to set the waiting time for the **Default Login**, **Locate**, **Assign IP**, **Upload Firmware**, and **Unlock** to complete.
- **Upgrade timeout (secs):** Use this option to set the waiting time for the connection to disconnect while the firmware is upgrading. Use this option to set the waiting time for the Firmware to write to flash.



Misc.

Search on start: Checkmark this box if you would like the search function to start searching for devices after you log in to the AWK search Utility.



5

Other Console Considerations

This chapter explains how to access the AWK-1121 for the first time. In addition to HTTP access, there are four ways to access AWK-1121: serial console, Telnet console, SSH console, and HTTPS console. The serial console connection method, which requires using a short serial cable to connect the AWK-1121 to a PC's COM port, can be used if you do not know the AWK-1121's IP address. The other consoles can be used to access the AWK-1121 over an Ethernet LAN, or over the Internet.

The following topics are covered in this chapter:

- **RS-232 Console Configuration (115200, None, 8, 1, VT100)**
- **Configuration by Telnet and SSH Consoles**
- **Configuration by Web Browser with HTTPS/SSL**
- **Disabling Telnet and Browser Access**

RS-232 Console Configuration (115200, None, 8, 1, VT100)

The serial console connection method, which requires using a short serial cable to connect the AWK-1121 to a PC's COM port, can be used if you do not know the AWK-1121's IP address. It is also convenient to use serial console configurations when you cannot access the AWK-1121 over Ethernet LAN, such as in the case of LAN cable disconnections or broadcast storming over the LAN.

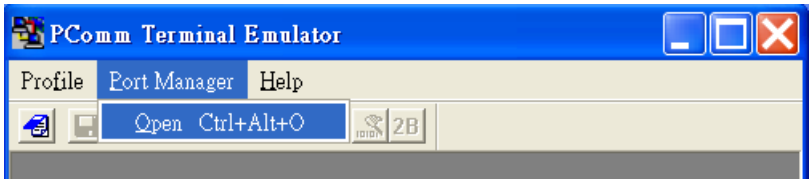
ATTENTION

Do not use the RS-232 console manager when the AWK-1121 is powered at reversed voltage (ex. -48VDC), even though reverse voltage protection is supported.
If you need to connect the RS-232 console at reversed voltage, Moxa's TCC-82 isolator is your best solution.

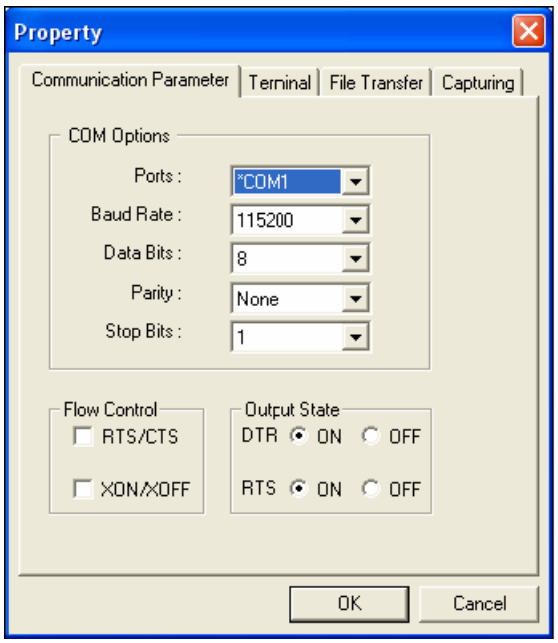
NOTE We recommend using **Moxa PComm (Lite)** Terminal Emulator, which can be downloaded free of charge from Moxa's website.

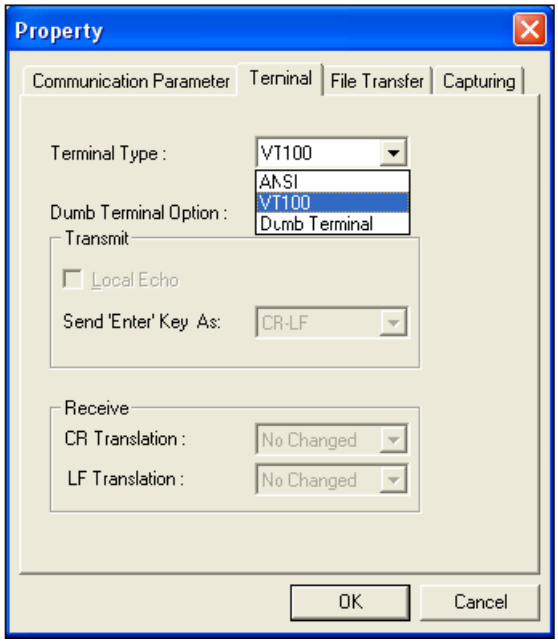
Before running PComm Terminal Emulator, use an RJ45 to DB9-F (or RJ45 to DB25-F) cable to connect the AWK-1121's RS-232 console port to your PC's COM port (generally COM1 or COM2, depending on how your system is set up). After installing PComm Terminal Emulator, take the following steps to access the RS-232 console utility.

1. From the Windows desktop, open the Start menu and start **PComm Terminal Emulator** in the PComm (Lite) group.
2. Select Open under Port Manager to open a new connection.

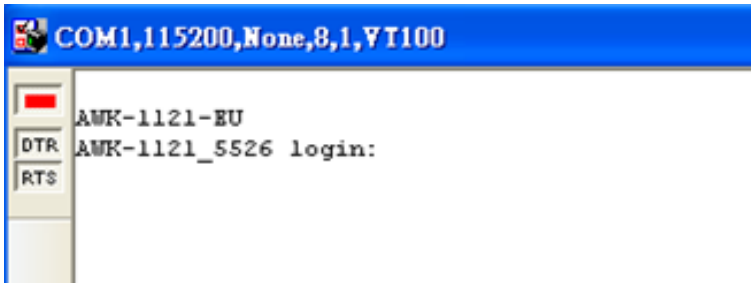


3. The **Communication Parameter** page of the Property window opens. Select the appropriate COM port for Console Connection, **115200** for Baud Rate, **8** for Data Bits, **None** for Parity, and **1** for Stop Bits. Click on the **Terminal** tab, and select **VT100 (or ANSI)** for Terminal Type. Click on **OK** to continue.

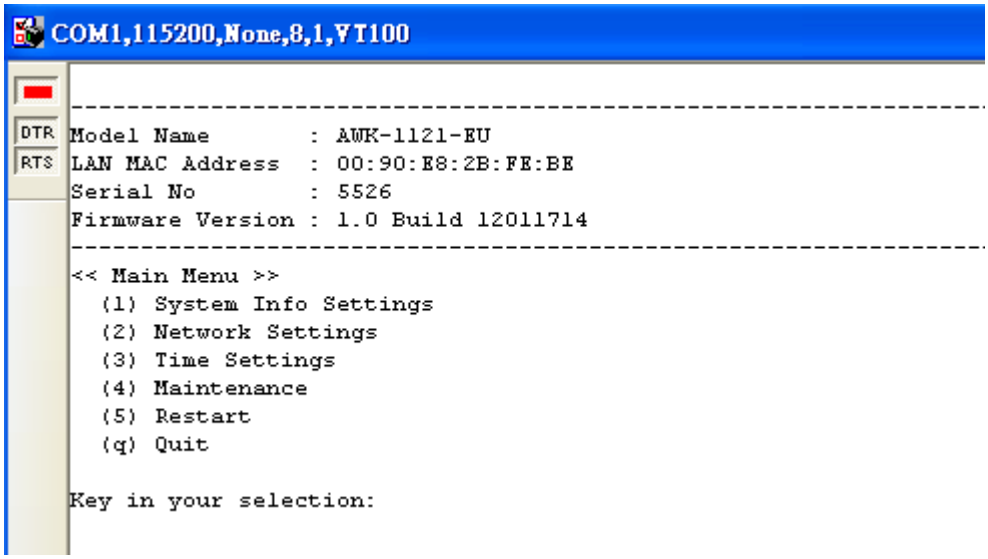




4. The Console login screen will appear. Log into the RS-232 console with the login name (default: **admin**) and password (default: **root**, if no new password is set).



5. The AWK-1121's device information and Main Menu will be displayed. Please follow the description on screen and select the administration option you wish to perform.



NOTE To modify the appearance of the PComm Terminal Emulator window, select **Edit → Font** and then choose the desired formatting options.

ATTENTION

If you unplug the RS-232 cable or trigger **DTR**, a disconnection event will be evoked to enforce logout for network security. You will need to log in again to resume operation.

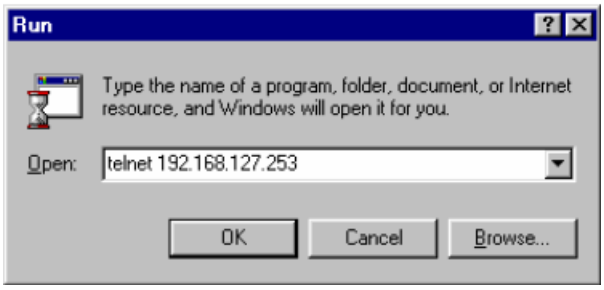
Configuration by Telnet and SSH Consoles

You may use Telnet or SSH client to access the AWK-1121 and manage the console over a network. To access the AWK-1121's functions over the network from a PC host that is connected to the same LAN as the AWK-1121, you need to make sure that the PC host and the AWK-1121 are on the same logical subnet. To do this, check your PC host's IP address and subnet mask.

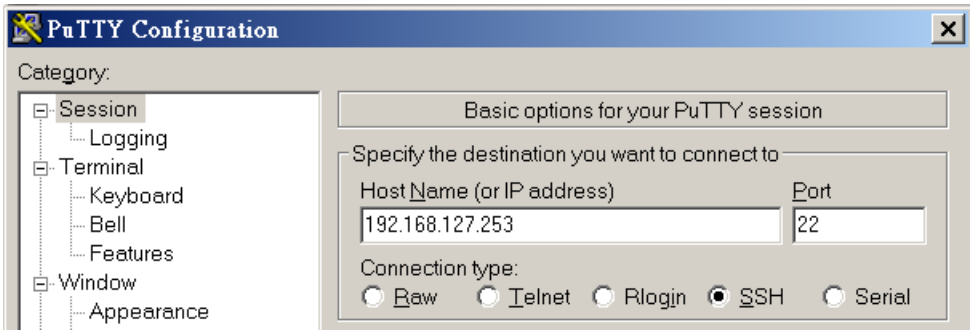
NOTE The AWK-1121's default IP address is **192.168.127.253** and the default subnet mask is **255.255.255.0** (for a Class C network). If you do not set these values properly, please check the network settings of your PC host and then change the IP address to 192.168.127.xxx and subnet mask to 255.255.255.0.

Follow the steps below to access the console utility via Telnet or SSH client.

1. From Windows Desktop, run **Start → Run**, and then use Telnet to access the AWK-1121's IP address from the Windows Run window (you may also issue the telnet command from the MS-DOS prompt).



2. When using SSH client (ex. PuTTY), please run the client program (ex. putty.exe) and then input the AWK-1121's IP address, specifying **22** for the SSH connection port.

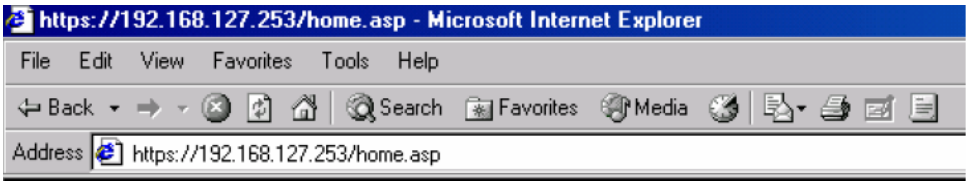


3. The Console login screen will appear. Please refer to the previous paragraph "RS-232 Console Configuration" and for login and administration.

Configuration by Web Browser with HTTPS/SSL

To secure your HTTP access, the AWK-1121 supports HTTPS/SSL encryption for all HTTP traffic. Perform the following steps to access the AWK-1121's web browser interface via HTTPS/SSL.

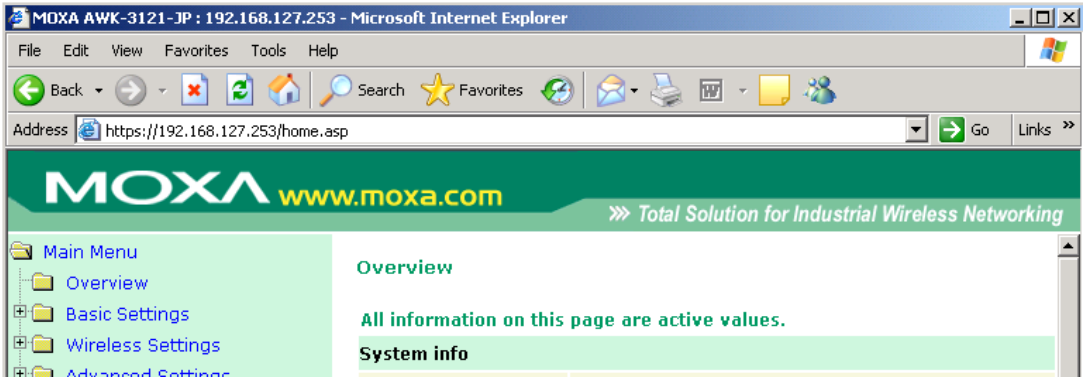
1. Open your web browser and type https://<AWK-1121's IP address> in the address field. Press **Enter** to establish the connection.



2. Warning messages will pop out to warn users that the security certificate was issued by a company they have not chosen to trust.

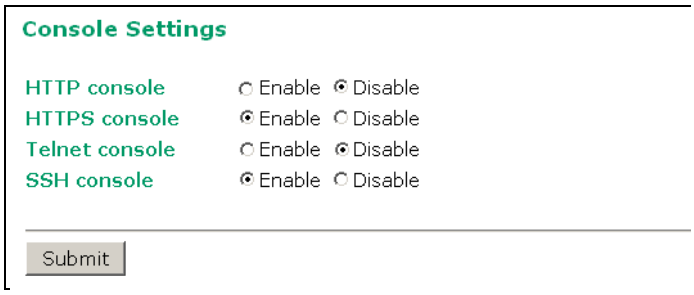
Security Alert
Information you exchange with this site cannot be viewed or changed by others. However, there is a problem with the site's security certificate.
The security certificate was issued by a company you have not chosen to trust. View the certificate to determine whether you want to trust the certifying authority.
The security certificate date is valid.
The security certificate has a valid name matching the name of the page you are trying to view.
Do you want to proceed?
Yes
No
View Certificate

3. Select **Yes** to accept the certificate issued by Moxa IW and then enter the AWK-1121's web browser interface secured via HTTPS/SSL. (You can see the protocol in URL is **https**.) Then you can use the menu tree on the left side of the window to open the function pages to access each of AWK-1121's functions.



Disabling Telnet and Browser Access

If you are connecting the AWK-1121 to a public network but do not intend to use its management functions over the network, then we suggest disabling both Telnet Console and Web Configuration. Please run **Maintenance** → **Console Settings** to disable them, as shown in the following figure.



A

References

This chapter provides more detailed information about wireless-related technologies. The information in this chapter can help you administer your AWK-1121s and plan your industrial wireless network better.

The following topics are covered in this appendix:

- **Fragment**
- **RTS threshold**

Fragment

A lower setting means smaller packets, which will create more packets for each transmission. If you have decreased this value and experience high packet error rates, you can increase it again, but it will likely decrease overall network performance. Only minor modifications of this value are recommended.

RTS threshold

RTS threshold (256-2346) – This setting determines how large a packet can be before the Access Point coordinates transmission and reception to ensure efficient communication. This value should remain at its default setting of 2,346. When you encounter inconsistent data flow, only minor modifications are recommended.

B

Supporting Information

This chapter presents additional information about this manual and product. You can also learn how to contact Moxa for technical support.

The following topics are covered in this appendix:

- **About This User's Manual**
- **DoC (Declaration of Conformity)**
  - Federal Communication Commission Interference Statement
  - R&TTE Compliance Statement
- **Firmware Recovery**

About This User's Manual

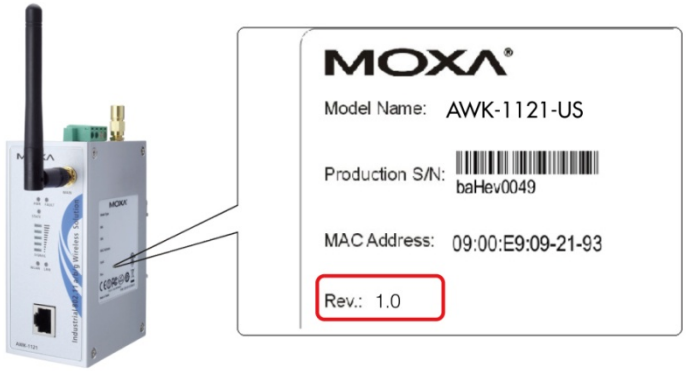
This manual is mainly designed for, but nto limited to, the following hardware and firmware for the AWK-1121:

- Hardware Rev: **1.0**
- Firmware Ver: **1.0**

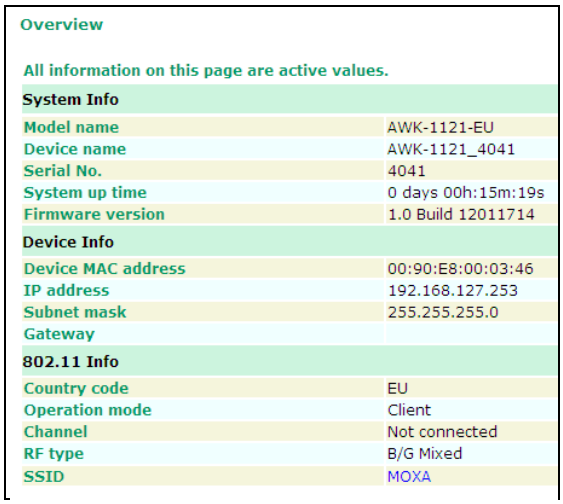
You are strongly recommended to visit Moxa's website (http://www.moxa.com) and find the latest product datasheet, firmware, QIG (Quick Installation Guide), UM (User's Manual) and related information.

NOTE

You can find out the hardware revision number of AWK-1121 on the side label.



The firmware version number can be seen on the **Overview** page, as follow:



Overview

All information on this page are active values.

System Info	
Model name	AWK-1121-EU
Device name	AWK-1121_4041
Serial No.	4041
System up time	0 days 00h:15m:19s
Firmware version	1.0 Build 12011714
Device Info	
Device MAC address	00:90:E8:00:03:46
IP address	192.168.127.253
Subnet mask	255.255.255.0
Gateway	
802.11 Info	
Country code	EU
Operation mode	Client
Channel	Not connected
RF type	B/G Mixed
SSID	MOXA

DoC (Declaration of Conformity)

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, (example – use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator & your body.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC 15.407(e): Within the 5.15-5.25 GHz band, U-NII devices will be restricted to indoor operations to reduce any potential for harmful interference to co-channel MSS operations.

NOTE The availability of some specific channels and / or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

R&TTE Compliance Statement

Moxa declares that the apparatus AWK-1121 complies with the essential requirements and other relevant provisions of Directive 1999/5/EC.

This equipment complies with all the requirements of DIRECTIVE 1999/5/CE OF THE EUROPEAN PARLIAMENT AND THE COUNCIL OF 9 March 1999 on radio equipment and telecommunication terminal equipment and the mutual recognition of their conformity (R&TTE).

The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) as of April 8, 2000.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacturer must therefore be allowed at all times to ensure the safe use of the equipment.

EU Countries Intended for Use

The ETSI version of this device is intended for home and office use in Austria, Belgium, Denmark, Finland, France (with Frequency channel restrictions), Germany, Greece, Ireland, Italy, Luxembourg, Portugal, Spain, Sweden, The Netherlands, and United Kingdom.

The ETSI version of this device is also authorized for use in EFTA member states Norway and Switzerland.

EU Countries Not Intended for Use

None.

Potential Restrictive Use

France: only channels 10, 11, 12, and 13.

Firmware Recovery

When the LEDs of **FAULT**, **Signal Strength**, **CLIENT**, **BRIDGE** and **WLAN** all light up simultaneously and blink at one-second interval, it means the system booting has failed. It may result from some wrong operation or uncontrollable issues, such as an unexpected shutdown during firmware update. The AWK-1121 is designed to help administrators recover such damage and resume system operation rapidly. You can refer to the following instructions to recover the firmware:

Connect to the AWK-1121's RS-232 console with **115200bps and N-8-1**. You will see the following message shown on the terminal emulator every one second.

```
Section userdisk Cksum error = 0xa5feadde --> 0x658c5051
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
```

Press **Ctrl - C** and the following message will appear.

```
Press Ctrl-C to enter Firmware Recovering Process.....
==========================================================================
IP address of AWK-1121 : 0.0.0.0
IP address of TFTP server : 0.0.0.0
==========================================================================
1. Start to firmware upgrade using the above network setting immediately.
2. Change the network settings.
Enter your selection :  (1-2,enter for abort): 
```

Enter **2** to change the network setting. Specify where the AWK-1121's firmware file on the TFTP server and press **y** to write the settings into flash memory.

```
==========================================================================
IP address of AWK-1121 : 0.0.0.0
IP address of TFTP server : 0.0.0.0
==========================================================================
1. Start to firmware upgrade using the above network setting immediately.
2. Change the network settings.
Enter your selection :  (1-2,enter for abort): 2

IP address of AWK-1121 : 192.168.1.2
IP address of TFTP server : 192.168.1.1
Update RedBoot non-volatile configuration - continue (y/n)? y
```

AWK-1121 restarts, and the "Press Ctrl-C to enter Firmware Recovery Process…" message will reappear. Press **Ctrl-C** to enter the menu and select **1** to start the firmware upgrade process.

```
Press Ctrl-C to enter Firmware Recovering Process.....
==========================================================================
IP address of AWK-1121 : 192.168.1.2
IP address of TFTP server : 192.168.1.1
==========================================================================
1. Start to firmware upgrade using the above network setting immediately.
2. Change the network settings.
Enter your selection :  (1-2,enter for abort): 1
```

Select **0** in the sub-menu to load the firmware image via LAN, and then enter the file name of the firmware to start the firmware recovery.

```
********************************************************************************
Load method select :
0. Load from LAN
1. Load from serial with Xmodem
q. Abort select.
********************************************************************************
Please select item : 0
Please input load image name..
Default file name : AWK-1121.rom
User Input file name : AWK-1121_1.0.rom
```